Mental Functions of the Brain

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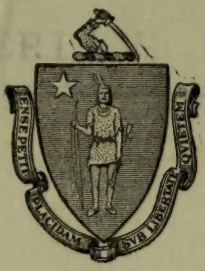

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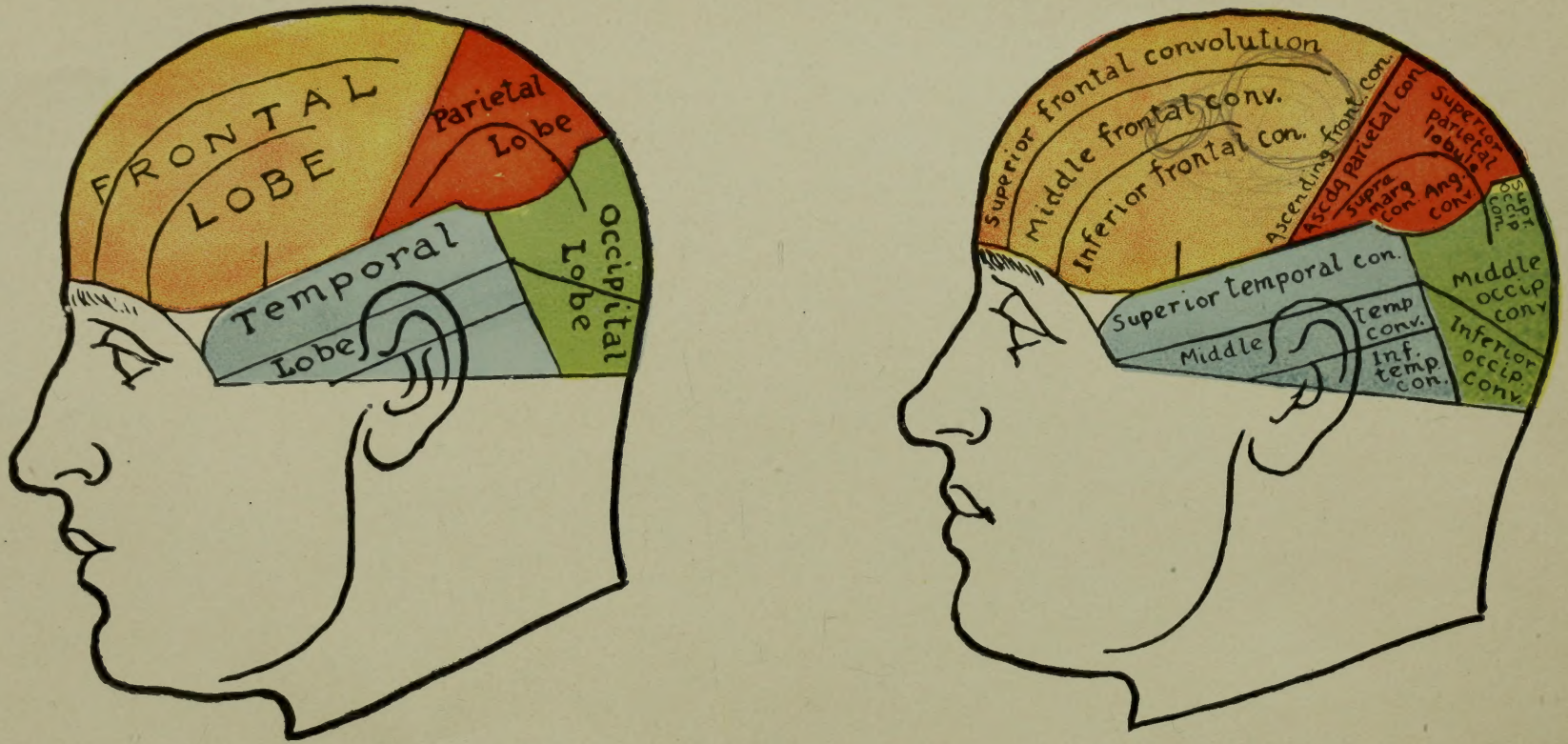

The surface-division of the brain and its relation to the cranium.
(Drawn after Reid.)

THE REVIVAL OF PHRENOLOGY

THE MENTAL FUNCTIONS OF THE BRAIN

AN INVESTIGATION INTO THEIR LOCALISATION AND THEIR MANIFESTATION IN HEALTH AND DISEASE

BY

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ILLUSTRATED WITH
THE CLINICAL RECORDS OF EIGHT HUNDRED CASES
OF LOCALISED BRAIN DERANGEMENTS
AND WITH SEVERAL PLATES

G. P. PUTNAM'S SONS
NEW YORK AND LONDON
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PREFACE

A SURVEY of the views of recognised authorities of the present day, as given in this book, tends to show that, whereas other branches of medical science have made great advances during the nineteenth century, our knowledge of the mental functions of the brain is still obscure, and deviations from the normal mind remain little understood and far off from cure. Much value has been attached to the experiments on the brains of animals, but all they can demonstrate amounts to a differentiation of sensory and motor areas; they must ever fail to shed light on the diversity of human talents and dispositions and the variety of mental derangements.

The present work aims at clearing up the mystery of the fundamental psychical functions and their localisation in the brain. It is the first work on the subject since the dawn of modern scientific research. While most previous investigators have confined their attention to the intellect alone, the author considers also the emotions and passions of man, normal and abnormal, and demonstrates their connection with the brain.

Even the most recent text-books deem insanity to

be a disease of the brain implicating the whole of that organ. Whether a person be melancholic, violently maniacal, homicidal, or suffer from delusions of persecution; whether he be a kleptomaniac, a religious maniac, or fancy himself a millionaire—in every case it is assumed that the whole cortex is affected, whereas the evidence adduced by the author shows that the fundamental varieties of mental derangement are localised in definite circumscribed regions, and frequently are, in the early stages at least, amenable to treatment. Brain surgery should, if future investigators confirm the author's observations, receive an immense stimulus to activity; and the data amassed by the author, and published in this work, are so considerable as to open up quite a new field for research.

The author has based his localisations chiefly on clinical and pathological investigations. Over eight hundred cases are adduced, not merely of the recognised varieties of mental derangement, but of all kinds of deviation from the normal mind, even as regards the manifestation of hunger and thirst. The book contains numerous cases of interest to lawyers, as well as physicians, and should prove of value to all students of human character.

The author found that his localisations confirm those made a century ago by Gall, whose marvellous discoveries of the anatomy and physiology of the brain—on which Spurzheim built his system of phrenology—were ignored even by his most scientific followers, so that the world is ignorant of them, and *they are pre-*

sented for the first time in this book. The history of Gall and his doctrine is given in these pages, and will be quite a revelation to the reader. No subject has ever been so thoroughly misrepresented, even by learned men of acknowledged authority, and no author has ever been so libelled and with such malice as Gall, and this notwithstanding the fact that *there is not one man of scientific repute who has written anything which would indicate that he has examined Gall's chief work, Anatomie et Physiologie du Système Nerveux en Général, et du Cerveau en Particulier* (4 volumes in folio, and an atlas of 100 plates; Paris, 1810–1819; price, 1000 francs or £40 per copy). The fact that they have not read Gall's great work should make those who have any bias on this subject pause and reflect—at least until they have read this book carefully and examined the evidence therein set forth.

Considering the important bearing which the facts contained in this work may possibly have upon the entire development of mental science, on the study and treatment of lunacy, on the education of the young, the precocious alike and the feeble-minded, on moral reform, the diminution of crime, and many other problems affecting the well-being of the community, the author trusts that the evidence and statements, which he produces after fifteen years of investigation, may be received willingly and in fair spirit, however critical.

62 Queen Anne Street,
Cavendish Square, London, W.
1*st March*, 1901.

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THE MENTAL FUNCTIONS OF THE BRAIN

CHAPTER I

THE PRESENT STATE OF MENTAL SCIENCE

1. Introduction.

2. The Cortical Area for Intellectual Operations.

3. The Lack of Progress in the Study and Treatment of the Insane.

CHAPTER I

THE PRESENT STATE OF MENTAL SCIENCE

1. Introduction

The brain as the organ of the mind—Why large brains are sometimes found with poor intellect, and small brains with great wisdom—The part the emotions play in human nature—Does an emotional insanity exist?—Lesions of the cortex without mental change—The American crowbar case, and its misrepresentation—Significance of the cortical motor area—The value of speculative philosophy—Special cortical centres for the primary mental functions.

ONE would suppose that with the combined forces of the different branches of medicine: anatomy, physiology, pathology, neurology, and psychiatrical science, we should have arrived at some very definite conclusions as to the functions of that structure through whose medium all mental operations take place. Yet if we set about to examine the knowledge accumulated, we find a great diversity of opinion prevailing, but very few facts on which to base a science.

The Brain as the Organ of the Mind

Most men regard mind as though the term were equivalent to intellect and did not include the feelings and fundamental impulses. Thus when we state the first fundamental principle, that *the brain is the organ*

of the mind, as to which we are supposed to be one and all agreed, we, in reality, differ widely according to the interpretation assigned to the word "mind."

The great majority hold mind to be equivalent with intellect, and from this opinion serious errors have arisen, which have retarded the progress of mental science. To such persons it is a puzzle that large brains should be found allied at times with poor intellect, and small brains with great wisdom. An explanation is sought for. Some there are who find the solution in differences in quality of the brain matter. This, however, is an insufficient explanation, for men of great intellectual ability, and apparently the same quality of brain, like Cuvier and Gambetta, occur, the one heading the list with the heaviest, while the other ranges at the bottom of the list with the lightest brain, Cuvier's brain weighing sixty-four ounces, and Gambetta's only thirty-nine, which is considerably below the alleged normal limit. To Spitzka, an American neurologist, the explanation proved a very simple one. He maintained that Cuvier's brain-weight represented not intellect, but healed up hydrocephalus. Celebrities with large heads will not feel flattered by such explanation. Science is rarely complimentary, but this is well-nigh libellous.

Another explanation put forward is that the differences obtaining in the weight of brains are due wholly to differences in the bulk of the body. This argument has been disposed of by Sir William Turner, who says: "The human brain, in all probability, attains its full size and weight at or about the age of thirty, whilst the body not only increases in weight after this period, but in one and the same individual may vary considerably in weight at different

stages of adult life, without any corresponding fluctuations taking place in the weight of the brain."

According to Colin, quoted by Topinard, the mouse has, in proportion to his body, more brain than man, and thirteen times more than the horse, and eleven times more than the elephant.

The error is in taking absolute size of the brain as a measure of *intellectual* power, whereas it indicates, as might be inferred *a priori*, absolute *mental* power, without determining whether that power lies in extent of intellect, in strength of moral feeling, or in force of passion or affection. They forget that the cortex of the brain records all the events, of whatever nature, which transpire within the sphere of existence of the individual, not merely as concerns the intellectual knowledge acquired, but likewise the emotions passed through, and the passions indulged in. Were these observers to weigh the different lobes separately, they would find that *the extent of the intellect varied with the mass of the frontal lobes*, and not with the entire brain. Hence a man with a very small brain may still be distinguished for his intellectual gifts, if the greater mass of his brain be situated in the anterior region; and a man may be intellectually an idiot, though with a brain of the same size, or larger, if the greater portion of his encephalon be situated in the posterior and lateral regions.

Most men utterly disregard this distinction. They confound intellectual power, moral feeling, and brute propensity, and treat the brain as if it consisted only of one lobe with only one function, namely, the manifestation of intellect. Thus Tiedemann inferred, and Sir William Hamilton concurred with him, that because the negro-brain is equal in weight to the European,

therefore the negro is also his equal in intellectual power. To prove this they would have had to show, not only that the two brains are equal in absolute size, but that the anterior lobe, or seat of intellect, is equally developed in both.

The Part which the Emotions play in Human Nature

Every man must, from his own consciousness, feel convinced that the human mind embraces in its domain something more than mere intellect. We all *feel* as well as *think*, and our judgment is often influenced by our feelings; in too many instances, indeed, the latter obscure or warp, or even completely subjugate, the former. Satisfaction, discontent, desire, fear, anger, jealousy, hatred, grief, etc., are so many states of our internal organisation, which the animal and the man do not determine, but which both feel before having thought of them. They exist for the preservation of the animal and man, without consciousness, reflection, or active participation on the part of the individual being necessary. The animal and man are so organised, because there are objects and events, which from their nature must be detested or loved, desired or feared. These mental states, when they reach a certain degree of intensity, do then what electric excitation does in a vivisected animal. They produce certain peculiar external acts, such as gestures, movements, attitudes, which likewise take place involuntarily, and without consciousness being necessary, and which always correspond, conformably to the designs of nature, to the preservation and the needs of the individual.

The intellectual life, the understanding, or reason, do

not supply the motives or impulses to action, but the feelings and propensities which create the desire for their gratification; and according as these latter vary in strength, so does the man's character vary. The intellect acts rather as an inhibition to the emotions; the greater the understanding the greater the check on the emotions and passions. Hence a child, a savage, and persons of little culture are less able to restrain their emotions. Women are, as a rule, more emotional than men.

Dr. Clouston, one of the few members now left of that Edinburgh school of thought, whereof Dr. Laycock antecedently was a prominent representative, has formulated the facts very clearly:

"In contemplating the phenomena of mind," he says, "we cannot fail to perceive the variety of its faculties, and that there is an obvious general division of them into intellectual and moral, the latter comprehending the propensities and impulses. The intellectual faculties are but a part of our mental powers, and contribute but little in fact towards forming what we call the *character* of an individual. We call to mind our acquaintances, and notice that their characters are very different, but this difference does not arise from the difference in their intellectual faculties, but in their moral powers. The character is determined by the moral faculties or propensities, by the affections, benevolence, love, selfishness, avarice, etc. The difference in the activity and energy of these creates the differences we see in the characters of men; those constitute the man himself, or the soul of man, while the intellectual faculties are but instruments to the wants and demands of the propensities. Without these propensities or moral faculties, the intellectual powers would not be

exerted at all, or but feebly. The stimulus or urgency of the impulses of our moral nature, of benevolence, love, avarice, etc., impel men to action—to gratify these the human race have forever toiled."

Those who have had sufficient opportunities of observing the primary manifestations of mental disease must be able to testify that in very many instances, long before any disorder or impairment of the intellect has been noticed or detected, some unaccountable change has been exhibited in the feelings or the conduct and social demeanour of its destined victims. Thus an intelligent, industrious, social, cheerful business man, in consequence of some falling off in business, becomes gloomy, taciturn, and utterly despondent; while another, whose temper was gentle, equable, and bright, becomes irritable, changeable, morose. He becomes harsh, overbearing, and cruel to his family, possibly even dangerously violent, and transforms his happy home into a den of constant strife and recrimination.

If the whole brain were subservient to the intellectual functions, what becomes of the insanity of conduct, of emotional insanity, of moral idiocy, and certain systematised insanities or monomanias, in which the perception, memory, and judgment remain unaffected? These affections can only be explained by disease of one part causing derangement of some of the intellectual faculties, while disease in another part may not disturb the intellect, but derange the moral powers or propensities.

Fielding-Blandford said that "There cannot be an emotional part of the mind or brain, capable of becoming insane, while the ideational portion remains sound and unaltered." Hence he concludes that in melancholia, "The emotional alteration points, not to a dis-

turbance of one portion of the brain, but to a pathological condition of the *whole* nervous system, of the highest significance."

The error into which Dr. Blandford and others fall is to judge the emotional state by its effects. They assume that because an emotion is an all-pervading one, its origin cannot therefore be localised. We might as well say that Bright's Disease is a disease of the whole body, and not of the kidneys, because a great many parts of the organism may be affected by it. *The intellect and the emotions are functions of two different parts of the brain.* Any idea may exist associated with almost any emotional state; it may also exist without the co-existence of any emotional state. Any simple emotional state, as fear or anger, may exist without being associated with any idea, without the simultaneous existence of any thought. A man may not be afraid; the individual simply suffers from fear, not from fear of something. Moreover, there is no relation between the intensity of emotional and intellectual action going on at the same time, as we should think must necessarily be the case if these two were functions of one and the same part of the brain. In any given individual the intellect may be highly developed and the passions and emotions very ill developed, or the reverse; so that we often see clever men with bad hearts, and men with excellent moral qualities who are exceedingly stupid. The fool may have a kind and affectionate heart, and the criminal a quick wit. Of course intellectual and moral defects may also co-exist.

The old alienists were evidently keener observers than our modern men are. They did not deny lesions of the emotions or passions, independent of the understanding. Thus Pinel says: "I have seen many

madmen, who at no time had manifested any lesion of the understanding, and who were under the dominion of a sort of instinctive fury, as if the affective faculties had been alone diseased."

Better than all arguments is the production of facts. In the chapter on Melancholia will be found 150 cases, in the chapter on Violent Mania, 350 cases, of localised brain-lesions.

Lesions of the Cortex without Mental Change

That changes in character are not considered as affections of the brain is evident from the frequent statement that injuries of the brain may be sustained without being accompanied by any mental symptom. Thus in a representative Journal on Insanity the statement is put forward by the Editors that "Abscess of the brain may exist, or portions of it may be carried away by gunshot or other injuries, and yet no perceptible difference be observed in the mentality of the individual." Surely the assumed integrity of the mental faculties in cases where the brain is injured or diseased rests on no foundation save ignorance or lack of attention on the part of the observer. If it were not so, of what good is the brain?

There are cases on record in which the memory of names, places, objects, numbers, dates, events, faces became lost and a circumscribed lesion was discovered, post mortem. How often does a clinical clerk enquire for such details? Other cases there are on record, very numerous indeed, of lesions of the brain which produced very marked emotional changes, from previous cheerfulness to melancholy, from gentle peacefulness to irascibility, from love of family to hatred of wife and

child. Again might it be asked, where is the clinical clerk who would notice such changes, and in case he did notice them, would suspect and look for a lesion of the brain !

Of course, if men will not admit the emotions and passions as being separate and distinct from the intellectual faculties, but consider the former merely as modes of affection of the latter, it is not difficult to conceive that a person entertaining such views might, for months long, attend on a patient, without noticing any perversion of propensities or sentiments. He might believe that the patient was able to manifest all his faculties unimpaired, seeing that by the word faculties he meant solely the intellectual powers. Does not the melancholiac reason clearly, and the patient with a systematised delusion judge correctly, if we can only grant his premises ? When a man, whose character has been of pacific tone, becomes, after having received a blow on the head, quarrelsome ; and another, whose previous inclination has been honest, after a similar injury, experiences an irresistible impulse to steal ; or a man previously of gay bent, after a brain-lesion becomes depressed ; or again, a fond mother, after a localised meningitis subsequent to ear-disease, becomes suspicious of her own children ; can we say of these individuals, who certainly retained their consciousness, memory, judgment, etc., that their wounds had exercised no influence upon the manifestation of their mental faculties ? In the author's opinion, too little opportunity is afforded in England for the study of the earliest stages of mental derangement. In the Asylum the disease, as a rule, is too far advanced, and in the General Hospital more attention is given to the physical symptoms than to the mental.

Dr. Ferrier says: "That mental symptoms or mental deficiencies have not been recorded in cases of bilateral cerebral lesions, is a negative statement of very little value. Unless a man becomes so demented as to neglect the ordinary wants of nature, or so furious, maniacal, or irrational as to require restraint, there are few engaged in the practice of medicine who think of enquiring narrowly into a patient's mental state; and even if more attention were directed towards this subject, are we in possession of any means of accurately gauging the mental condition of an individual, so as to be certain that it has altogether escaped damage, notwithstanding the presence of a cerebral lesion? I see little to justify and much to contradict such an assumption. A man may not be incapacitated for the ordinary duties of life, but that his mental powers are altogether unscathed even by a unilateral lesion, I venture to question." Now, there are many men who have quite given up regarding the brain as the organ of the mind; they see only in the cortex a field for motor and sensory centres. If any one soever is entitled to an opinion, surely it is the discoverer of these centres, and this is what he says: "If it is difficult to test the mental condition in a human being, how much more difficult must it be in the case of the lower animals. And yet, from the way in which some have treated this question, one would be led to believe that nothing was more simple."

There is always some one to quote the "American Crowbar Case," which has served for forty years as a classical case that violent injuries to the brain may occur without doing any mental damage. It is unfortunate that even our most recent text books

continue to promulgate such an error. In Halliburton Kirkes' *Handbook for Physiology*, 16th edition, 1900, it is stated that: "A crowbar was sent through the frontal region of the foreman's head, removing the anterior part of his brain. He, however, recovered, and *no noteworthy symptoms were observed* in him during the rest of his life. He, indeed, returned to his work as overseer to the mine." Assuming, as the author does, that the frontal lobes are the centres for the intellectual processes, a severe lesion of them would deprive a patient of the power of inhibiting the activity of his emotions and propensities. Such was the case with this patient, who showed a marked predominance of evil impulse and considerable moral depravity. Contrary to the statement in the *Handbook*, the patient did not return to work. Here is Dr. Harlow's report, under whose care the patient came immediately after the accident:

Phineas P. Gage, aged 25, while he was engaged tamping a blasting charge in a rock with a pointed iron bar, three feet seven inches in length, one inch and a quarter in diameter, and weighing thirteen and a quarter pounds, the charge suddenly exploded. The iron bar, propelled with its pointed end first, entered at the left angle of the patient's jaw, and passed clean through the top of his head, near the sagittal suture in the frontal region, and was picked up at some distance covered with blood and brains. The patient was for the moment stunned, but within an hour after the accident, he was able to walk up a long flight of stairs, and give the surgeon an intelligible account of the injury he had sustained. His life was naturally for a long time despaired of, but he ultimately recovered, and lived twelve years and a half afterwards. This is what Dr. Harlow says as to the patient's mental condition: His contractors, who regarded him as the most efficient and capable foreman in their employ previous to his injury, considered *the change in his mind so marked* that they would not give him his place again. The equilibrium or balance, so to speak, between his intellectual faculties and animal propensities seems to have been destroyed. He is fitful, irreverent, indulging at times in the grossest profanity (which was previously not his custom), manifesting but little deference for his fellows, impatient of restraint or advice when it conflicts with his desires, at times pertinaciously obstinate, yet capricious and vacillating.

Devising many plans of future operation, which are no sooner arranged than they are abandoned in turn for others appearing more feasible. *A child in his intellectual capacity and manifestations, he has the animal passions of a strong man.* Previous to his injury, though untrained in the schools, he possessed a well-balanced mind, and was looked upon by those who knew him as a shrewd, smart business man, very energetic and persistent in executing all his plans of operation. In this regard, his mind was radically changed, so decidedly that his friends and acquaintances said he was "no longer Gage."

The Significance of the Cortical Motor Area

The misrepresentation of the crowbar case is only on a level with the misrepresentation of the motor centres. Were the interpretation which Dr. Ferrier has given to them generally accepted, *i. e.*, that "the centres, besides being centres of voluntary motion, have a psychical significance, and form, as it were, the motor substrata of the mind," we should have the greatest assistance in discovering their corresponding mental functions. But this is not the interpretation given to them by the general physician, who sees nothing but centres for motion and sensation in the brain; the fundamental faculties which compose reason, or emotion, or passion, have no existence with him.

Even Flechsig, the discoverer of the association-centres, fails to recognise the psychical significance of the motor area. In his opinion, "the height of the forehead is no measure of the intellectual disposition in a man, for the height depends partly on the development of the motor area and the latter on the size of the body." Every line in this sentence is wrong. Sir William Turner's statement to the effect that the motor area does not depend on the size of the body, has already been quoted. Secondly, the height of the forehead is not a measure of the extent of the frontal lobes. Neither would be the width, or the depth, or the

vaulting—none of these taken singly. To measure the mass of the frontal lobe we must take the measurements of all these. The like mistake was made some years ago by the *Athenæum* in an article on "Retreating foreheads and their relation to the intellect." Thirdly, the motor area has no connection with the height of the forehead; the fissure of Rolando, around which the motor centres are grouped, is much farther to the back.

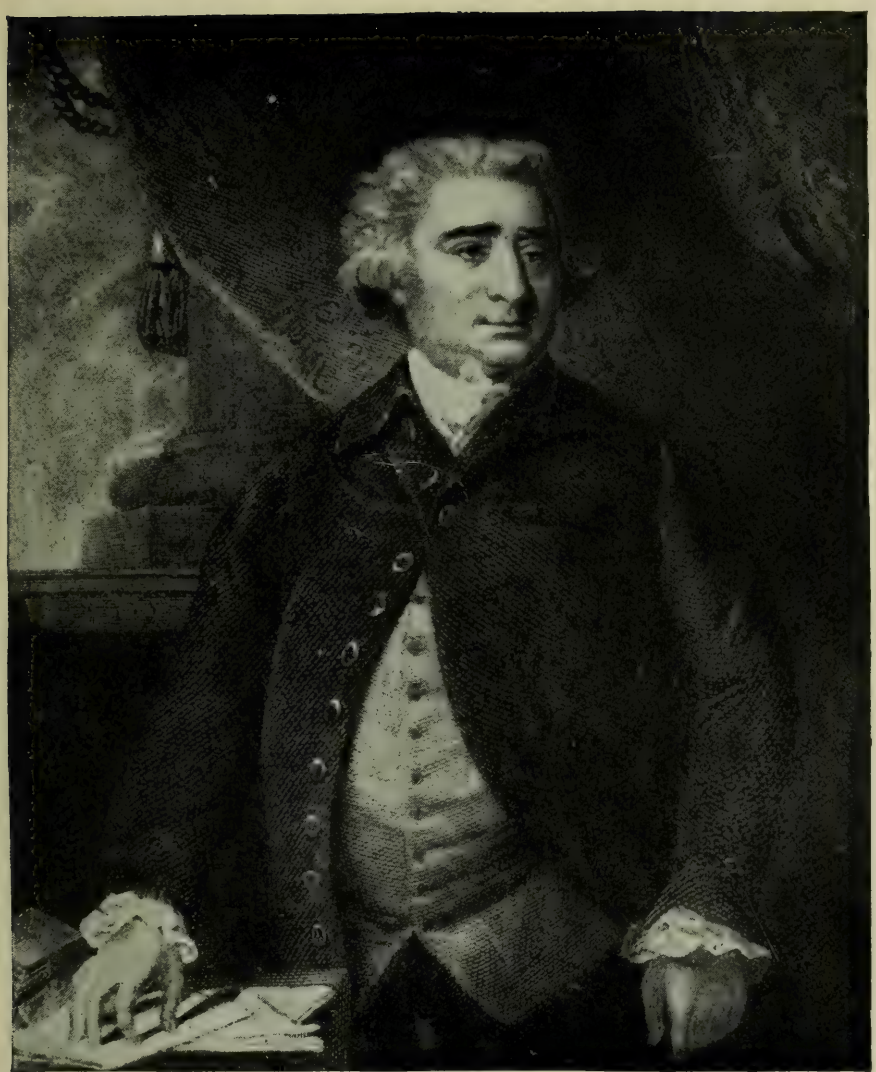
Is the high forehead a mere idle freak of nature? Look at Tennyson's portrait; look at the supposed portrait of Shakespeare; look at the extraordinary height of Sir Walter Scott's head, not to mention a host of well-known living men. Is it not strange that some can see a depression in the arm centre of a man, whose arm was amputated some years previous to his death, but that they cannot see the vast difference in the formation of heads of men around them, regional differences, which amount sometimes to as much as four inches? Were they in the habit of observing these, many errors would be avoided, as, for instance, that "the posterior lobes are the centres of intellect." Anthropologists have described long, short, broad, narrow, round, oval, cylindrical, keel-shaped, and sugar-loaf heads. What can be the significance of these? Is it that we differ so much in the development of our motor and sensory centres, or is it that no two of us are alike in the proportion of our intellectual faculties, feelings, and propensities? The savages of the interior of Borneo or of Western Australia have the same motor and sensory centres as the highly cultured Englishman, yet the former's sole business of life is to eat and drink.

Have we, as medico-psychologists, nothing to say on the subject? Does clinical observation go for nothing? Is the laboratory man, the experimental physiologist,

to teach us the mental functions of the brain from his experiments on frogs, pigeons, rabbits, dogs, cats, and monkeys? At best, such experimental observations can reveal only the centres for movements of particular groups of muscles and of special sensations. Clinical observation, on the other hand, is conducted on *human* beings, and reveals loss of reflective faculties, loss of particular memories; it reveals accentuated feelings and propensities, for instance of the emotion of fear, of irascibility, of the hoarding instinct, of attachment to home and family, of self-consciousness, etc.

The experiments which have been made upon the living brain of animals by means of electricity, and have been carried on for some thirty years, are not of a nature to reveal anything concerning the mental functions of the brain. The manner in which such experiments are conducted renders success in this direction altogether impossible. A monkey, dog, cat, or other dumb animal, is by the application of chloroform reduced to a state of apparant insensibility, and thereby rendered incapable of manifesting any kind of emotion. After a part of the skull has been cut away, electricity is applied to a definite region of the brain thus laid bare, and a particular limb or a group of muscles is seen to contract or move; a certain other part of the brain is irritated and other muscles are seen to contract; the phenomena being of a purely physical character without a single vestige of thought or feeling; just as seen in the puppet, where "you pull the string and the figure moves."

The speech centre was not discovered in the laboratory. Half a hemisphere can be scooped out from an animal's brain, apparently without any effect on its mental nature, if we are to believe experimenters, yet



From a picture by Sir Joshua Reynolds.

Charles James Fox (1749–1806).
Statesman.

A clever, **practical** man, who appreciated the **pleasures of this life.**
Contrast the **height** of this head with that of Montaigne.

a trifling injury to the cortex of the brain may render a man insane.

No hypothesis of motor and sensory functions will make us understand, for example, the character of the born criminal; his moral obtuseness, his cunning and resourcefulness, his excessive vanity, his lack of sympathy, and a hankering for some object lying within reach. These are all inborn characteristics, quickened to activity by vicious environment. It is worthy of note here that criminal anthropologists have found, in the central convolutions, the most numerous deviations in the brains of criminals, yet it cannot be said that their motor functions are in any way impaired. If a man's brains be made up only of motor and sensory areas, copy-book maxims would be all that is requisite to render a man virtuous and persevering.

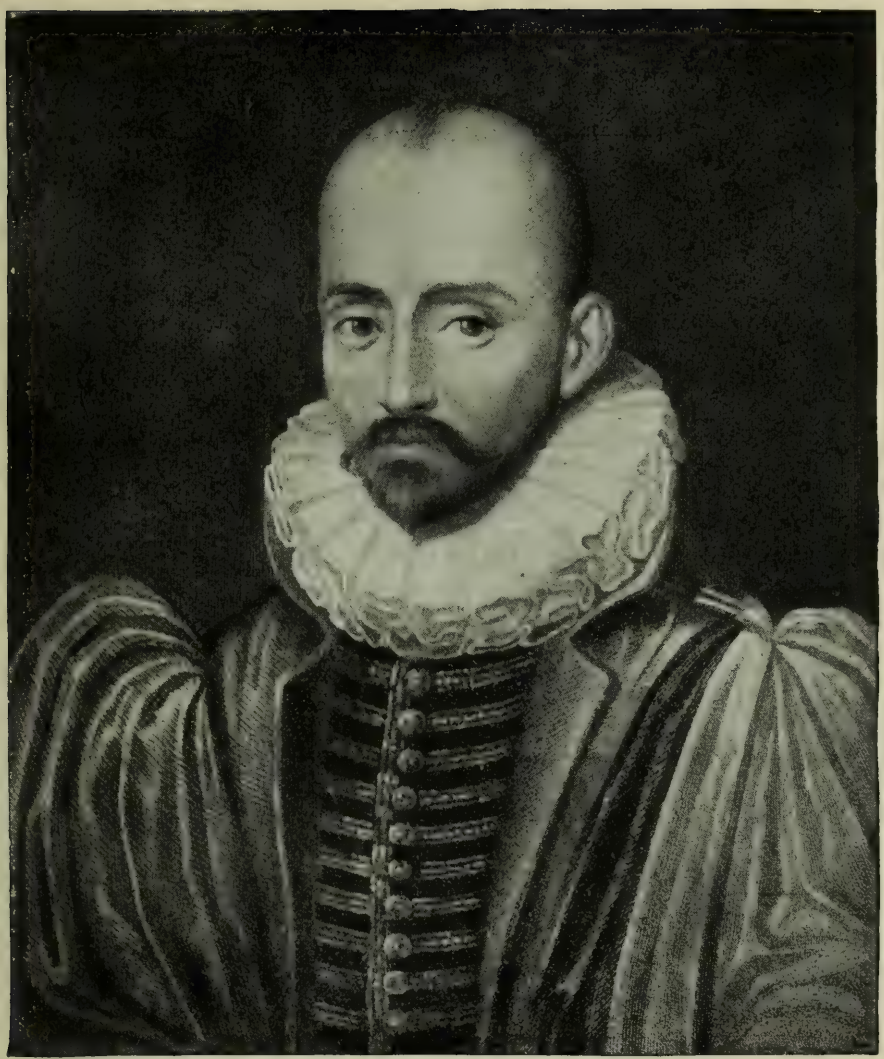
Motor centres will not explain why one man is more ambitious, or more proud, selfish, or more sympathetic than another. Or again, why some men place their happiness in the possession of riches, and others in a philosophy which elevates them above the human kind. Or furthermore, wherefore a son, who has inherited somewhat exclusively the qualities of his father, should be found so frequently to fail with his failures, sin with his sins, excel with his virtues, and speaking generally, to edge through life in much the same kind of fashion.

The error some men commit lies in regarding the central area of the brain as a *motor* area, whereas they should speak of it as the *psycho-motor* area. Ferrier had a clearer insight in this respect than those who preceded or those who have followed him in his experiments. "It will be seen," he says, "that the movements recorded in the above experiments as resulting from excitation of the individual centres are purposive

or expressional in character, and such as we should, from psychological analysis, attribute to ideation and volition if we saw them performed by others. The clutching or striking movement of a cat's paw is not a single muscular contraction, but is a complex and combined action of numerous muscles all directed to one end. Of course we have no other guide than our own consciousness to the interpretation of the actions of the lower animals, but as in ourselves or others we attribute such apparently purposive complex movements to ideation and volitional impulse, we may conclude that *the cortical centres are not merely motor but voluntary motor, and concerned with the outward manifestation of intelligence.*"

The Value of Speculative Philosophy

If it be unwise to place too much reliance on the results obtained in the laboratory and the deductions drawn from them by the experimenter, it is still more unwise to take as a guide to mental science the doctrines of speculative philosophers. Herbert Spencer or Auguste Comte can hardly come under this category, for both placed their speculations on the accumulated knowledge of their time, that is, on science. Englishmen, as a rule, are too practical to devote themselves to philosophy based on self-introspection. Not so the Germans, who are ever ready to quote their "arm-chair philosophers," particularly Schopenhauer. This author held that injuries to the brain never produced a change in the character of men. "Injuries to the head with loss of brain substance," Schopenhauer says, "are as a rule very detrimental to the intellect; they are followed by total or partial idiocy, loss of speech, temporarily or permanently, and so on. *Whereas we never read*



From a picture in the Archives du Royaume, Paris.

MICHEL DE MONTAIGNE (1532–1592).
Philosopher,

Of a **spiritual** character, who lived in a **world beyond.**
Notice the similarity to *Calderon's* head, another **mystic**,
Plate XI., p. 274.

Some scientists are unable to see any difference in the shape of heads; others declare that such difference, when it does exist, is due to the varying thickness of the skull, or to the size of the body requiring a larger "motor-area," or to any other cause but the true one,—the development of the brain consentaneous with definite mental inclinations.

that after an accident of this nature the character has undergone a change, that the man has become morally better or worse, that he had lost particular propensities or passions, or gained any; no, never!"

Flechsig quotes the following remark from a work by Paulsen, Professor of Philosophy of Berlin University: "Ideas do not exist in the brain. One might just as well say they are in the stomach or in the moon. The one would not be more absurd than the other."

There is no system of philosophy existing which could explain the difference in the talents and character of different individuals; for example, why amongst a number of school-boys who gain prizes, one excels in the study of history, another in poetry, a third in mathematics, a fourth in geography, and a fifth in drawing. Why is it that some young men are eager for political employment, some for military glory, while others devote themselves in preference to literature, philosophy, or the natural sciences? Why do some become musicians, others painters, sculptors, engineers, mathematicians, philologists, travellers, actors, poets, orators, astronomers, etc.?

The faculties recognised by metaphysicians are, amongst others, attention, memory, understanding, and will. If these were really fundamental forces, there would be no reason why they should be manifested so differently, according as they are exercised on different objects. There would be no reason why the same individual should not learn geography, music, mechanics, and arithmetic with equal facility, since one's memory would be equally faithful for all these things. But where is the man who, after the greatest possible application, succeeds with equal ease in these different branches of knowledge? As regards attention, some

men who are attentive to mathematics would fall asleep whilst others are talking of music. A painter may pay attention to pictures, but he does not care about science. The scientific man, on the other hand, is all attention to science, and unless he be endowed with the artistic sense as well, he pays no attention to art. A coquette's whole attention is engrossed by the milliner's shop ; she would pass the most valuable collection of natural history, or the richest library, with perfect indifference. As regards *desire* or *will*, there are as many sorts of desires and inclinations as there are fundamental powers. Combative men wish to fight every man who attacks them. Proud men wish people to think them very important. Benevolent men wish every one to be well taken care of. Nor is there a fundamental power of *judgment*. We see persons who can judge perfectly of colours, but not of music. Some can judge rightly of mathematics, yet not of poetry. One individual may possess strong attention, ready perception, a tenacious memory, a very correct judgment, an inventive and brilliant imagination *in one particular talent*, and prove well-nigh imbecile in another.

Memory, attention, judgment are attributes of all the faculties of the mind. They could not be restricted to any particular portion of brain. In this respect mind is a unit, and cannot be parcelled out to any particular areas. Otherwise with the special memories, they admit of being localised. There are numerous cases recorded in which one or more special memories were lost, while the rest remained intact. Thus the memory for words has gone, while that for tunes, number, and places has been maintained. Or again, the memory for tunes disappeared, while the memory for numbers, or

words, was maintained. *Examples of this kind of circumscribed lesions will be found in a subsequent chapter.* They will enable us to explain why among idiots there are to be found special instances of extraordinary memory, of great calculating power of histrionic ability, of musical art, or of great manipulative skill.

Special Cortical Centres for the Primary Mental Functions

Numerous arguments might be adduced besides those already quoted, showing that different areas of the cortex subserve different mental functions. The difference in structure alone would lead one to expect diversity of function. If we believe, moreover, as Bastian has pointed out, in anything like order or uniformity in the operations of the higher nervous centres, we are bound to arrive at some doctrine of localisation. Furthermore, the existence of facts, such as that injuries of the head affect not infrequently one or more of the mental powers, while others remain perfectly sound, would render the supposition far from unreasonable, that different portions of the cerebral hemispheres have different mental functions allotted to them. "If the mental functions be not separate and independent," observes Dr. Cheyne, "it is not surprising that as in youth certain faculties come into active operation before others, so in advancing life the mind is not broken down simultaneously; does not yield by uniform and gradual decay, as might be expected were it uncompounded and its several faculties only varied modes of action; but some one faculty is debilitated or destroyed before any failure is discoverable in the rest." These circumstances, and others of a similar kind, are "much more in accordance with the existence of a plurality of

faculties, in some manner independent, than with the notion of the whole mind being engaged in every act of memory, comparison, judgment, etc."

Sir James Crichton-Browne writes: "I take it as an established fact that insanity is a disease of the brain which does not always involve the whole of that organ, but which, in a large majority of cases, is localised in certain regions of it. This hypothesis is necessary to the explanation of the innumerable varieties of insanity which occur, and is borne out by pathological observations as far as they go, and by analogy drawn from the affections of other organs. But if there is localisation of function in the brain, and if insanity, which consists in morbid modifications of brain function, is dependent upon local lesions, we ought to be able to determine with more or less precision the position of the brain-lesions, or of its functional derangements in certain cases of insanity. The enquiry must be an eminently difficult one, for reasons which need scarcely be enumerated, but still it must be undertaken if real progress is to be achieved in psychological medicine."

Yet the possibility of localising mental functions is not universally recognised. Thus Dr. Yellowlees wrote: "I find nothing to warrant the conclusion that localisation of mental manifestations can ever be possible. Has the most enthusiastic physiologist ever dreamed that he could localise in any spot of brain an all-pervading emotion, like hope or fear? Can the necroscopist distinguish the brain of a scoundrel from the brain of a Christian hero? Nay, he often cannot distinguish an insane brain from a sane one. Localisation of mental phenomena seems in their very nature to be impossible."

To this I would reply that if hope, or fear, has not

been localised, it may be because no one has attempted to do so. If we assume in advance that it is impossible, we are not likely to undertake the investigation. *In the chapter on Melancholia will be found the clinical records of one hundred and fifty cases, in all of whom one particular brain-area was affected.*

As regards the distinction between the brain of a scoundrel and that of a Christian hero, criminal anthropologists have described the brains of the former, and, I presume, the opposite type would fit the latter. Dr. Maudsley, too, has made an attempt to describe the two types of head. Thus he describes a *noble head:* "From the forehead the passage backwards should be through a lofty vault, a genuine dome, with no disturbing depressions or vile irregularities to mar its beauty: there should be no marked projections on the human skull, formed after the noblest type, but rather a general evenness of contour." Of a *brutal head* he says: "The bad features of a badly formed head would include a narrowness and lowness of the forehead, a flatness of the upper part of the head, a bulging of the sides towards the base, and a great development of the lower and posterior part; with those grievous characters might be associated a wideness of the zygomatic arch, as in the carnivorous animal, and massive jaws. A man so formed might be expected, with some confidence, to be given over hopelessly to his brutal instincts."

2. The Cortical Area for Intellectual Operations

Frontal lobes *versus* posterior lobes—Are the sensory centres the perceptive centres?—Supposed absence of posterior lobes in animals—The facts of anthropology—Pathological facts—The frontal lobes as centres of inhibition—Conclusions.

Frontal Lobes *versus* Posterior Lobes

While some men are still arguing against the possibility of localising in the brain the mental functions, others have already located at least the purely intellectual processes. It has been a universal belief at all times that the *frontal lobes*, or more correctly speaking, the pre-frontal lobes, are concerned with the highest intellectual operations. Of late, however, some very distinguished men, masters in their department of science, have declared themselves in favour of the theory that the *posterior lobes* of the brain contain the intellectual centres, and since the *Handbook for Physiology* for 1900 supports this view, which is taught in several medical schools, we cannot pass it over without a searching analysis.

Professor Carpenter was the first to express this view. Later, Dr. Bastian strongly insisted "that the posterior lobes of the brain had more to do with the intellect than the anterior." Dr. Hughlings Jackson not only concurs with Dr. Bastian "that the posterior lobes are the most important parts of the brain for intellectual purposes," but "agreeing in this," he goes a step further and supposes "that disease of the right posterior lobe produces greater mental defect than disease of the left does." The most active in promulgating this view has been Professor Schäfer, and his late assistant Professor, the editor of the *Handbook for Physiology*, is further spreading the doctrine which

has also been advocated by Dr. Clapham in the *Journal of Mental Science* for April, 1898.

What are the grounds on which such a view can be based? The *Handbook for Physiology* contends that experimental physiology lends no support to the view that the frontal brain is the seat of the intellectual faculties, "as the sensory centres (and sensations are the materials for intellect) are situated behind or within, and not in front of the Rolandic area."

According to this view all knowledge would be a knowledge of sensations. The different talents, for music, poetry, mathematics, etc., should all be simple modifications of one or more of the five senses. It would lead us to assume that men are born with equal original mental capacity, opportunities and education determining the differences of subsequent development. Laura Bridgman, the blind deaf-and-dumb woman, was remarkably intelligent, and Miss Helen Keller, a similarly afflicted pupil of the Perkins' Institution, has even taken the first prize at a recent examination in competition with normal girls. I am not aware that the three remaining senses, through which these ladies had to be taught, the senses of taste, smell, and touch, are situated in the occipital lobe. The centre of sight is assumed to be connected with this area, but this is only one sense, and if this theory be correct, a blind man ought to have highly developed temporal lobes, for in him the sense of hearing must be more acute, the auditory centre being connected with this part of the cortex. The observation made by Dr. Howe three years after the introduction of Laura Bridgman into the Perkins' Institution for the Blind does not harmonise with the theory of the intellectual centres being in the *occipital* lobes, for he wrote: "A perceptible

change has taken place in the size and shape of her head, there is a marked increase in the size of her *forehead.*"

If all our ideas derive from the senses, what becomes of the general and purely intellectual ideas, whose significance is wholly independent of the material world? For example, "there is no effect without a cause." If all our ideas come from the senses, then the mind should be always proportionate to the greater or less delicacy of these same senses. If the existence of Homer be doubted, there certainly was Milton, who was blind at an early age, but what imagination can be stronger and more brilliant? Beethoven was deaf while still a fairly young man; his deafness accentuated his natural disposition to suspicion, but he did not cease to compose music. Moreover, have not animals in many respects more perfect senses than man?

Why should the sensory region be just the *intellectual* region? The *feelings and passions* can be aroused just the same, and much quicker, as the result of the objective perception gained through the medium of the eye. Not only does the sensation of sight arouse emotion, but it differs according to the emotion we are already in. How the earth shines to the accepted lover! How sombre to him as deepest midnight when suddenly jilted! How sweet is life to the young mother as she gathers in both hands the rosy cheeks of her infant and stoops to kiss its puckered lips! How bitter, how hateful, when she casts herself all sobbing upon its new-made grave!

We must distinguish in the act of vision between the mere perception of an object, and an intelligent knowledge thereof as to its nature and qualities. *The centre of sensation is not necessarily the centre of perception.* Perception is complex and consists not only

of the visual impression, but the impression of solidity, form, size, and position, which vision alone would never give without the aid of the other senses. Perception, then, cannot take place in the occipital lobe, for it only contains the centre of sight. It must take place in a higher centre where all the sensory impressions are co-ordinated, that is, in a perceptive centre, which WUNDT, who is admittedly an authority on physiological and experimental psychology, locates in the *frontal* lobes.

Those who hold that the sensory centres are the centres of intellect, and that thus knowledge results wholly from the experience of the individual, fall into an error as great as if they were to ascribe all bodily growth and structure to exercise, forgetting the innate tendency to assume the adult form. "Were the infant born with a full sized and completely constructed brain, their position would be less untenable. But as the case stands, the gradually increasing intelligence displayed throughout childhood and youth is more attributable to the completion of the cerebral organisation than to the individual experiences—a truth moved by the fact that in adult life there is sometimes displayed a high endowment of some faculty which, during education, was never brought into play. Doubtless, experiences gathered by the individual furnish the concrete materials for all thought. Doubtless, the organised and semi-organised arrangements existing among the cerebral nerves can give no knowledge until there has been a presentation of the external relations to which they correspond. And, doubtless, the child's daily observations and reasoning aid the formation of these involved nervous connections that are in process of spontaneous evolution, just as its daily gambols give aid to the development of its limbs. But saying this is quite a

different thing from contending that its intelligence is wholly produced through its experiences. That is an utterly inadmissible doctrine—a doctrine which makes the presence of a brain meaningless—a doctrine which makes idiocy unaccountable."—(Herbert Spencer.)

Some have declared—Sir Benjamin Brodie for instance—that the posterior lobes are lacking in animals, which, as far as regards intelligence, are placed below man, but this is not the fact. Many animals, such as the elephant, the dolphin, the ape, etc., have the cerebellum as much covered by the posterior lobes as in the case of man. The error has its source in the position of the head, more or less horizontal or vertical in animals. Comparing the male and female brains in the same species, it will be observed that in all females, the posterior lobes are more developed, more completely covering the cerebellum, than in males. If these lobes were connected with the higher intellectual faculties, it should follow that women excel men as to the noblest faculties of the mind.

The very early development of the anterior lobes in the vertebrate scale has also been adduced as an argument against its being the seat of perception and reason, but it is clearly in favour of this theory, for as the seat of perceptive consciousness, these lobes must necessarily be developed anteriorly to those that are in relation to the moral powers and sentiments.

A capacious forehead is generally agreed to be indicative of superior intellectual endowments. The ancient sculptors have always expressed divine intelligence by increasing the dimensions of the forehead, and I do not know of a single modern painter or sculptor who would or does express great intellectual powers by a design of a large back-head.

The Facts of Anthropology

Hermann Wagner compared the mean proportions of the cortex in Man and the Orang. The occipital lobes proved larger in the Orang than in Man, while the frontal lobes were considerably smaller. He also weighed each lobe of the brain of Gauss, the mathematician, and of other eminent men, and compared it with the weight obtained from the brains of working-class men. The workmen had the smallest frontal lobes, but larger occipital lobes than the celebrated mathematician.

Still more remarkable are the figures reached by a comparison of the anterior and posterior lobes of different races. In the Charib the anterior lobes are very small, in perfect harmony with the poverty of the intellect; on the other hand, in the Hindoo, a high race, as we are fully aware, the anterior lobes are well developed.

Gratiolet distinguished the principal divisions of our species by that bone of the skull which is relatively the largest. Thus: 1, Frontal or Caucasian; 2, Parietal or Mongolian; 3, Occipital or Ethiopic. He has shown that in the Caucasian, the anterior fontanelle is the last to ossify, in order to permit of the greatest possible development to the frontal lobes; and that in the Ethiopic race the converse condition obtains, the posterior fontanelle being the last to ossify. According to this arrangement, in the superior races, the frontal lobes of the hemispheres continue to develop themselves for a long time after the occlusion of the posterior sutures has put an end to the growth of the rest of the brain; in the inferior races, on the contrary, the ossification of the sutures proceeds from before

backwards, and thus the anterior parts of the brain are first arrested in their growth.

The important researches made in reference to ancient skulls by the Abbé Frère, whose rich collection is in the Anthropological Museum at Paris, led him to the conclusion that the skulls of Europeans have increased in size since historic times; and that the progress of civilisation seems to have resulted in *raising the anterior, and flattening the occipital part of the skull.*

With the view of verifying the accuracy of the theory that the development of the higher faculties of the intellect is in relation to the development of the anterior region of the skull, and that the frontal lobes form the substrata of those psychical processes which lie at the foundation of the higher intellectual operations, Broca examined the heads of thirty-two house-surgeons who had successively resided at Bicêtre during the years 1861–1862, and compared their dimensions with those of the heads of twenty-four porters attached to the various wards of the same hospital. This comparison resulted in the confirmation of the generally received opinion, that the anterior lobes are the seat of the highest order of intellectual faculties; and Broca considered that he had demonstrated that the cultivation of the mind and intellectual work augment the size of the brain, and that such increase affects chiefly the *anterior* lobes.

Dr. Parchappe has also made measurements and found that *the frontal* lobe in men of learning has much larger proportions than in common working-men.

MM. Lacassagne and Cliquet have examined, by aid of the *Conformateur*, the heads of 190 doctors of medicine, 133 rudimentarily educated persons, 90 illiterate persons, and 91 prisoners (soldiers), with the following results: There was a considerable difference in

size of head in favour of the doctors, and this was especially marked in the *frontal* measurement. In the educated, the frontal region was more developed to the left, and was altogether proportionately more developed than the occipital region, which was the larger in the case of the illiterate.

Schroeder van der Kolk wrote: "That to all parts of the cerebral convolutions are not assigned exactly similar functions was long ago suspected. Further, that a finely arched forehead indicates, as a rule, high intellectual endowment, was already not unknown to the Greeks, as we may conclude from their delineations of a Jupiter, Apollo, and so forth. The strongly prominent forehead as the prerogative of man, came yet more definitely into view when Camper proposed the facial angle named after him, and pointed out its difference in Azteks, Negroes, and Europeans, in children likewise and in grown up persons."

Maudsley says: "That the high, broad, and prominent forehead marked intellectual power, was a belief which the ancient Greeks entertained, and which has long been popularly held; and the notion that lowness and narrowness of the forehead indicates intellectual inferiority is in harmony with the observations that in the Negro, and more markedly in the Bosjesman, the anterior part of the hemispheres is narrower than in Europeans, and that the narrowing of the frontal lobes to a point is one character by which the brain of the monkey differs from that of man."

Facts of Experimental Physiology

Bianchi found after destruction of the frontal lobes in dogs and monkeys, that the curiosity to observe, which is so marked in monkeys, is lost; that they are

not able to receive new impressions, or to remember or reflect on the old ; and, that since they can no longer criticise they become timid and easily excited. The frontal lobes appear to him not only centres of perception and reflection, but also co-ordination centres of the rest of the brain. He says: "The animals remain friendly, they still caress or show affection. They can get into wild excitement. They show fear more readily. They become cautious, but cannot avoid accidents; these strike terror into them. They eat with reckless avidity. They are duller and sleepy. Physiognomy stupid; expression cruel. They show no gratefulness. They cannot adapt themselves to new surroundings, neither learn anything new, nor regain what they have forgotten." His hypothesis is "that the frontal lobes are the seat of co-ordination and fusion of the incoming and outgoing products of the several sensory and motor areas of the cortex. The frontal lobes sum up into series the products of the sensory motor regions, as well as the emotive states which accompany all the perceptions, the fusion whereof constitutes what has been termed the *psychical tone* of the individual. Removal of the frontal lobes does not so much interfere with the perceptions taken singly, as it does disaggregate the personality, and incapacitate for synthetising groups of representations. The actual impressions which serve to revive these groups, thus succeed one another disconnectedly under the influence of fortuitous external stimuli, and disappear without giving rise to associational processes in varied and recurrent succession. With the organ for the physiological fusion which forms the basis of association, disappear also the physical conditions underlying reminiscence, judgment and discrimination, as is well shown in mutilated animals."

Colella considers, as a result of his experiments, the pre-frontal lobes the seat of the highest psychical functions.

Richet, de Bayer, Duret, and Grassel, regard the frontal lobes as the seat of the intellectual faculties.

Dr. MacAlister says: "Increased growth of the frontal lobes is the physical accompaniment of intellectual activity."

Both Hitzig and Goltz confirm the occurrence of a mental deterioration from lesion of the pre-frontal regions.

Ferrier observed that "after removal or destruction by the cautery of the antero-frontal lobes, the animals retain their appetites and instincts, and are capable of exhibiting emotional feeling. They have lost, however, the faculty of attentive and intelligent observation." He locates the centres of reflection in the frontal lobes.

These are the observations made by independent and unprejudiced observers, some of whom, like Ferrier, Hitzig, Richet, have also had vast clinical experience, and are in the habit of looking for mental as well as physical symptoms. Yet the *Handbook for Physiology* for 1900 says that Experimental Physiology lends no support to the view that the frontal brain is the seat of the intellectual faculties.

Pathological Facts

It is universally known that in senile dementia and dementia of any kind, including dementia paralytica or general paralysis of the insane, the greatest atrophy occurs in the frontal lobes. The occipital convolutions are hardly ever involved. If the higher intellectual processes were carried on in the occipital lobes, these would necessarily show atrophy. This fact alone should

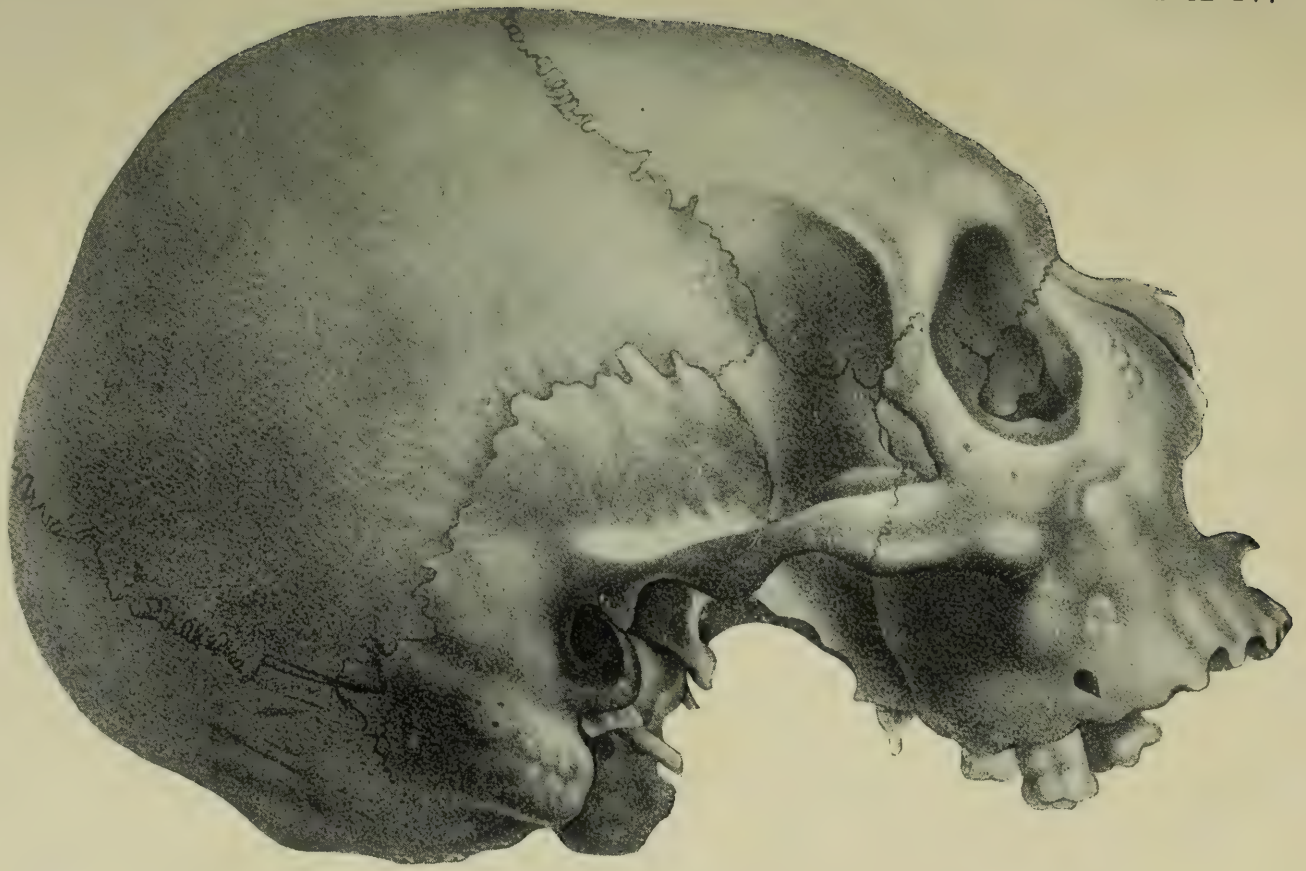
condemn the theory of the occipital lobes being concerned with the functions of pure intellect.

The convolutions of the frontal lobes are very simple in imbeciles, often only half an inch in width. Sometimes they may appear larger than normal, but that is owing to the deficient development of the rest of the brain, and even then could the deficiency of intellect be accounted for by the simpleness of the convolutions and the want of development of the nerve cells.

Carl Vogt wrote: "The conformation of microcephalous brains depends on an arrest of development which does not involve the entire brain. The arrest is chiefly in the anterior or frontal lobes."

Ferrier says: "The frequent association of idiocy with defect of the frontal lobes is a generally recognised fact."

Allen Starr says: "In respect of judgment and reason the power of man surpasses that of the lower animals. The brain of man differs from that of the lower animals and of idiots chiefly in the greater development of the frontal lobes. It seems probable, therefore, that the processes involved in judgment and reason have as their physiological basis the frontal lobes. If so, the total destruction of these lobes would reduce man to the grade of an idiot. Their partial destruction would be manifested by error of judgment and reason of a striking character. One of the first manifestations would be a lack of that self-control which is the constant accompaniment of mental action, and which would be shown by an inability to fix the attention, to follow a continuous train of thought, or to conduct intellectual processes. It is this very symptom which was present in one half of the cases here cited. It occurred in all forms of lesions; from injury by foreign bodies, from



From Vimont's Atlas (reduced).

Skull of an **Idiot-Girl** Twenty Years Old.

Notice the defective development of the frontal region.

destruction by abscess, from compression and softening due to the presence of tumors, and therefore cannot be ascribed to any one form of disease. It did not occur in lesions of other parts of the brain here cited."

Anton gives the following description of the symptoms of lesions of the frontal lobes: "Injury to one frontal lobe has, as a consequence, that the intellectual functions can be carried on only with greater exertion. The memory and judgment are weakened, and continued attention is rendered difficult. If the disease extends to the other frontal lobe as well, then we have sudden and hopeless dementia."

Charles K. Mills' view: "Lesions of the *pre-frontal* lobe, although this is one of the so-called latent districts of the brains, have in a large percentage of the carefully studied cases shown distinctive manifestations. The symptoms are largely psychical, and unfortunately the physician is not usually well trained to study such phenomena. Mental disturbances of a peculiar character occur, such as mental slowness and uncertainty, want of attention and control, and impairment of judgment and reason; closely studied, the inhibitory influence of the brain both upon psychical and physical action is found to be diminished."

The Frontal Lobes as Centres of Inhibition

The frontal lobe, as the seat of the reasoning faculty, is an inhibitory apparatus against the lower and more instinctive natural impulses. The higher its development, the more it overbalances the rest of the brain, and the greater its tendency to subordinate the instincts of self-preservation and the egoistic feelings to the intellect, to act as a check on the animal propensities. If

this inhibition becomes weakened, then we see the disordered predominance of the actual instincts and impulses, and when it is totally lost, the individual is in the position of a criminal, who opposes the ethical order of society.

Goltz found, when the frontal lobes are destroyed the inhibitory power over the propensities is lost, and such an animal changes its character for worse, the same as has been observed in the classical Crowbar Case of Gage. The reflex excitability is greatly increased.

Flechsig says: "The result of the action of physical impulses upon the cortex is a struggle between sensory impulses and reason. As soon as the power of the mental centres is paralysed, the impulses are deprived of mental control, and passion reigns unbridled."

L. F. Barker, Professor of Anatomy and Pathology in Johns Hopkins University, says: "When the intellectual centres are paralysed, there often results most marked disorganisation of the mental processes, and most serious alterations in the character of the individual. The struggle between the lower instincts and the ethical feelings may cease, and instead of a rational man we see a creature given over entirely to the satisfaction of his lower desires."

It is the highly developed intellect of man which changes the innate animal instincts into glorious faculties. Thus the animal desire of propagating the species is transformed in man to moral love; the love of female animals for their offspring provided by nature to preserve their young, becomes in women the amiable virtue which inspires their tenderness for their children; the attachment of animals changes in man to friendship; their sensibility to caresses changes into ambition and a sentiment of honour; the instinctive building of

nests by birds and of huts by beavers is at the root of man's nobler dwellings, of his temples and palaces.

It is the frontal lobe with its connecting fibres to all the remainder of the brain to which this difference is due. The larger the anterior lobes in proportion to the rest of the brain, the more refined will be the expression of the emotions and even of the passions of man, and the greater control will he be able to exert over them. Let the frontal lobes be arrested in development, or affected by disease, and man descends to the animal stage.

Conclusions

From the arguments and evidence adduced in the foregoing pages it would appear:—

1. That the size of the entire brain is not a measure of intellectual power alone, but a measure of the strength of intellect, sentiments, and propensities, taken together.

2. That the sensory areas are not the areas of intellectual perception and reflection, and that the occipital lobes are not concerned with the higher intellectual processes.

3. That the motor and sensory centres alone would be insufficient to explain the diversity of human character and the varieties of mental derangement; that they are the substrata of mental centres, and therefore psycho-motor and psycho-sensory centres.

4. That the frontal lobes alone are an index to a person's intellect, and their mass has to be judged by all the measurements which are used for the estimation of the size of a body; that the head may be small in a person of wisdom, provided the frontal lobes are relatively the most prominent.

5. That memory is not a single faculty, but that there are centres in the brain for the individual memories, number, time, place, tune, etc., besides the memory of words which is already located.

6. That there must be centres for the fundamental emotions and propensities in the cortex, separate from the centres for purely intellectual processes.

7. That the intellectual faculties control and elevate the sentiments and propensities, and that thus the anterior lobes are the centres of inhibition of the rest of the brain.

3. The Lack of Progress in the Study and Treatment of the Insane.

Opinions of Sir James Crichton-Browne, Sir Henry C. Burdett, Sir John Batty Tuke, Dr. Weir Mitchell, Dr. David Ferrier, and others.

As is evident from the foregoing, mental science has made but small progress. Without a sound mental science, however, we can neither study nor treat aright the insane. Hence no wonder that this subject has made but little progress during the lapsed century.

So little progress have we made that there is not a man existing who can tell a good head from a bad one, or a clever head from a stupid one. So little progress have we made that whether a man is suffering from violent mania, melancholia, or dementia, the entire brain is in all cases deemed to be involved, notwithstanding the vast amount of evidence that has been accumulated to the contrary, but up to now wholly disregarded.

One would have thought that with the vast material at hand, the various investigators were fully agreed as to the growth and development of the brain, yet listen to the statement by Dr. Wm. A. Hammond, who asserted that the brain does not grow after the seventh

year; only the scalp, muscles, and fasciæ grew after that time. Dr. Hammond, whose "profound acquirements as a physiologist and skill as an original investigator" were praised by the reviewer of the *Journal of Mental Science*, said: "A fact which is somewhat astonishing to those not aware of it, is that the head of a boy or girl does not grow in size after the seventh year, so that the hat that is worn at that age can be worn just as well at thirty." — (*Popular Science Monthly*, 1887, vol. 31.)

Every hatter's apprentice knows to the contrary. At the same time mere hatter's measurement does not determine the entire magnitude of the brain. It only gives its extent in one direction—horizontally. It does nothing towards ascertaining the depth of it perpendicularly, I mean from its base to its arch or top. One man may require a larger hat than another, and yet have a smaller brain, on account of the greater depression of the top of his head. Even after the brain has ceased to enlarge horizontally, it may continue to grow in the other direction.

Though a boy of thirteen should require as large a hat as he does when he is a man of twenty-five, it does not follow that his whole head and brain must be as large—nor are they. The brain, if exercised intellectually or emotionally, continues to grow till middle age, as can be ascertained by measuring definite regions.

Soemmering in his time stated the maximum growth was reached at three (!) years of age; Wenzel, between 6 and 7; Tiedemann, between 7 and 8 years, and Dr. Ireland is reported in the *Journal of Mental Science* to have said: "As far as he knew, the growth and development of the brain were complete about the time of puberty. *The brain was fully developed at*

about ten or twelve years of age, after that followed the higher function, the reproduction of his kind."

Even a layman will find the statement of Dr. R. M. Buke, made at the Annual Meeting of the British Medical Association at Montreal, September, 1897, surprising, which is as follows: "The musical sense does not appear in the individual before the average age of about twenty years." This, notwithstanding the history of Handel, Mozart, and other prodigies. Would it not be more correct to say, that if a man is not a musician at twenty, he never will be one?

To those who hold that "There is no emotional insanity," the large number of cases, recorded in this book, in which the emotions alone were involved, must come as a surprise.

Dr. G. H. Savage, in his Presidential Address to the Medico-Psychological Association, 9th August, 1886, has declared that "insanity, as generally understood, does not accompany brain-tumours." Yet in subsequent chapters will be found numerous records of tumours of the brain, all accompanied by symptoms of insanity, varying according to the part of the cortex which they involved.

Another authority describes the present state of our knowledge of the pathology of insanity in most despairing manner. He says:—

"We are in the same position, in which one would find himself without a guide upon the field of a recently fought battle—given over to a feeling of melancholy wonderment at the carnage and devastation which give evidence of the violence of the struggle, but not of the operations whose theatre he surveys.

"Of all organs, the brain is least known, either anatomically or physiologically, and consequently, the

medical psychologist cannot be expected to detect slight deviations from a normal standard he does not possess. Hence has arisen the assertion that very often not the slightest irregularity is to be found in the brains of persons dying insane."

Sir J. Crichton-Browne, M.D., Lord Chancellor's Visitor of Asylums, read in the Psychological Section of the British Medical Association Meeting at Cambridge, August, 1880, the following indictment:—

"Any one accustomed to the literature of general medicine, and turning to that of psychological medicine for the first time, must, I think, be struck by the comparative paucity of reports of cases in the latter, or at least of reports of cases intended to illustrate diagnosis, or the grouping of symptoms in mental diseases. True, in our special journals, cases of insanity may, from time to time, be found described; but these are almost invariably published because they illustrate the success or futility of some kind of treatment, or the morbid anatomy of some coarse lesion in the nerve-centres, and not because they are typical of any variety of psychical derangement.

"The records of cases indeed which are issued from lunatic asylums, whatever be the motive of their publication, are singularly deficient in information bearing on the modifications of the higher cerebral functions, and many of us would be puzzled at this moment, were we asked by any zealous student, to refer him to a series of clinical delineations which would convey to him a just conception of the nature and procession of the impairments of the senses and intellect, or perversions of the emotions and will, which correspond with the commonest forms of insanity.

"If we enquire the reason of this paucity of clinical

reports of cases of insanity, we shall, I believe, find that it is to be attributed to several causes. In the first place, asylum medical officers have been called on hitherto to give so large a proportion of their time and energy to administrative, sanitary, and routine duties, that they have had little left to expend on minute and tedious observations at the bedside or in the wards. Without clinical clerks, or with a very inadequate number, they have had to keep their own medical records, and have therefore confined these within narrow limits, and made them of an eminently practical character. Thus it has come about that the case-books of most asylums have been kept for official rather than scientific purposes, and do not afford the information that is necessary for the preparation of clinical reports.

"In the second place, the medical men who enter asylum practice are ordinarily unprepared by previous training to sift and classify the special phenomena that then fall under their notice, even if they had the leisure and disposition to do so. Unacquainted with the physiology of mind, they are bewildered by its morbid manifestations, and lack that knowledge of terms and those habits of thought that are essential to an accurate analysis of psychical derangements.

"In the third place, the observation of aberrations of mind is exceedingly difficult and laborious, even to those who are qualified for the task, and hence few have had the intrepidity to undertake it.

"And in the fourth place, the attempts as yet made in this direction have not proved of much real value, while their speculative interest has not served to secure perseverance in them. No practical benefit or guidance has seemed to accrue from anything beyond a vague and general survey of the mental condition in insanity,

and so we have learnt to be content with comprehensive phrases, such as excitement, depression, and incoherence, and have had little encouragement to draw up inventories of symptoms, which we invariably failed to connect with pathological changes.

"If we come upon what is apparently a tolerably isolated patch of diseased mind, we are utterly incompetent to indicate the whereabouts of its pathological substratum. And it seems to me that standing as we do in the light of modern researches into the functions of the brain, we must work in all cases of insanity towards a localisation of the lesion, and a recognition of its nature.

"We must aim at an anatomical and a pathological diagnosis, and these are only to be reached by a careful study of symptoms and of their mode of onset and associated conditions. We are perhaps far off any success in localising and characterising mental diseases, but the endeavour to do so should at least be made, and that it may be made trustworthy, clinical records are a first requisite."

The same author is quoted by Sir T. Clifford Allbutt (*Journal of Mental Science*, October, 1891) to the following effect:—

"Of course, there are in some asylums at this time, very able scientific medical men, and there is a little scientific work going on, but a large proportion of inmates do not get medical treatment at all; it is not attempted.

"It is not an uncommon thing for a young medical assistant, fresh from the schools, who has perhaps never seen a case of insanity in his life, to be put into one department and given entire charge of it."

Some ladies with a family of three or four, and a

staff of an equal number of servants, find the daily domestic arrangements of their household too much for them. Let them read carefully the duties of the Medical Superintendent, as explained by Sir Henry C. Burdett (*Hospitals and Asylums of the World*, London, 1891):—

"We may glance at the routine of daily work performed by the medical superintendent of any of our larger county asylums. Occasionally between the hours of 6 and 8 A.M., he will visit the workshops or farm, or perhaps run through the dormitories or wards, or visit the dining hall when the patients are at breakfast; but his regular duties may be said to begin by opening the morning letter-bag. This generally happens at 8.30 A.M., and about 9 o'clock he will be found in his office arranging the mass of correspondence lying before him. The letters from patients' friends are at once answered, and afterwards passed on to the assistant medical officer, by whom the answer is copied on to one of the forms used for conducting this correspondence. (By this means the medical superintendent answers all enquiries from patients' friends, while the assistant medical officer is cognisant of the opinion which the superintendent has expressed concerning every patient, and a copy of his opinion is always forthcoming in case of its being wanted.) When this is finished, the superintendent will be prepared to receive and examine the reports presented to him by the head attendant and head nurse. He notes the number of patients in the house, the number under medical treatment, the number employed, the number of epileptic fits recorded during the previous twenty-four hours, how the recent cases or any special cases have rested during the night—in short, everything that has happened

since the last reports were presented, and in his own pocket note-book he transcribes everything which he thinks needs further investigation or elucidation in consultation with any of the staff. The storekeeper then attends with the order-book, in which each order is countersigned by the medical superintendent, and instructions given as to the work to be done in the stores and shops. The housekeeper will be in attendance should anything be required in her department, and once weekly she presents a return of all articles received into the laundry and delivered therefrom.

"Later on, the clerk will hand in the copies of the orders of admission of recent cases, in which the statement of mental and bodily conditions has to be entered previous to their being forwarded to the Commissioners' office. If any deaths have taken place, the certificates are filled in for transmission to the same office, to the coroner, the registrar, and the relieving officer.

"It is almost certain that some special work will be on hand requiring the presence of the superintendent, or a visit may be made to some particular ward or part of the asylum.

"The medical superintendent visits the wards daily and makes a complete round of the house, examining any special cases, and conversing with those recently admitted. The sanitary condition of the buildings has to be thought of, and any defective ventilation or warming remedied.

"Post-mortem examinations are often made, and he will be present at them. The farm, too, will claim his attention, and a walk over it will be an agreeable change from his office and ward duties.

"About six in the evening the superintendent will be again in his office to receive the reports, if any, from

the heads of the male and female departments. He will post up his diary, and perhaps again visit one of the infirmaries or one of the receiving wards; or perhaps new patients have been admitted since he visited the wards, and these he will see, and leave instructions concerning their diet, amount of supervision necessary, and arrangements for their sleeping.

"Such is a brief résumé of the duties which the medical superintendent has to face almost daily.

"The duties which the assistant medical officer is called on to perform so closely resemble the routine of hospital or dispensary work that no previous special training is necessary. Indeed, many superintendents prefer men who come straight from the medical schools to the asylum. Except in the Middlesex Asylum at Hanwell, the English County Asylums have only one medical superintendent, and *the proportion of assistant medical officers is one to about 430 patients.*"

Another testimony to the same effect by Sir John Batty Tuke (*Nineteenth Century Magazine*, April, 1889):—

"The superintendent again is the *entrepreneur* of entertainments; amusements of all sorts have to be got up, parties, balls, theatricals, picnics, cricket matches, and *fêtes* of all kinds. The public thinks that madness can be eliminated by entertainment.

"It is true that he (the superintendent) has assistant physicians under his command, in the proportion of something like one to 500 patients, but these are usually lads fresh from college, having had little experience of general medicine, and who are supposed to be qualifying themselves for the specialty.

"The great fault of our lunacy system is that our asylums are not hospitals, and that their physicians are

not allowed to fulfil the proper duties of their office. Have we any assurance that what we do for the comfort of the mass is not hurtful to the cure of the individual? Let it be remembered that the treatment of a case is for the most part carried on without even a theory as to the condition of the brain; symptoms alone are treated, on the purest empirical principles.

"It is impossible for me within the limits of this article to speak in detail of the ill effects of asylum treatment. That a certain number recover in consequence of it, that a certain number recover in spite of it, that a certain number become demented because of it, are, I believe, each and all equally true statements. A man merged in a crowd of irresponsible beings, all under the influence of a common discipline, and under the control of common keepers, must lose his individuality, and cannot possibly receive that anxious care and attention at the hands of one physician which is necessary from the nature of his case. What every case of insanity demands as the primary condition for recovery, is separate and individual treatment and consideration. What every asylum requires in order to become a truly curative institution, is a hospital for the treatment of recent and acute cases, separate and distinct from the main establishment, to which each patient should be consigned on admission. Its medical staff should be ample, and their duties should be entirely restricted to the observation and treatment of new cases.

"Insanity must be studied by the various lights of medical science systematically and steadily. Until it forms an integral part of medicine, we cannot look for an increased meed of relief to the individual or to the public. Until the general practitioner becomes well acquainted with its features, we can look for no reduc-

tion of the heavy burden of lunacy. At present he is, speaking generally, utterly unacquainted with even the superficial clinical appearances of the conditions. The observation of insanity is not included in the curriculum of medical study[1]; eight out of ten men obtain their diplomas, and become 'registered medical persons,' without having even seen a lunatic, and yet the law invests them with very considerable powers over the liberty of the subject in virtue of a knowledge it believes they possess, but which they have had no opportunity of obtaining.

"The difficulty of teaching the future general practitioner even the little that is known is immense, as we have no hospitals for clinical instruction."

George M. Beard on "The Problems of Insanity."—"The best thing to do with disease is to prevent it; the next best thing is to cure it when it first appears; the last and least important of all, is to attempt to cure its later stages, and it is with this last and least important duty that the asylums of the world are mainly occupied. . . . The practical problem of the future is, how to educate physicians in the study of insanity so that they shall know its premonitory symptoms, and treat and cure it before it appears, or just after it appears. The insane must be treated before they are insane."

The gravest accusations against our modern lunacy-system have been made by that celebrated American Neurologist, Dr. S. Weir Mitchell, in an address before the fiftieth annual meeting of the American Medico-Psychological Association, held in Philadelphia, 16th May, 1894, of which the following is an abstract:—

[1] The College of Physicians now requires of every medical student to have attended a course of lectures on Insanity.

Dr. Mitchell laments the day when "the treatment of the insane passed too completely out of the hands of the profession at large, and into those of a group of physicians who constitute almost a sect apart from the general medical profession. It is a monarchy more or less limited. . . . We have done with whip and chains and ill-usage, and having won this noble battle, have we not rested too easily content with having made the condition of the insane more comfortable? . . .

"Frankly speaking, we (Neurologists) do not believe that you (Alienists) are so working these hospitals as to keep treatment or scientific product on the front line of medical advance. . . . Where, we ask, are your annual reports of scientific study, of the psychology and pathology of your patients? They should be published apart. We commonly get as your contributions to science, odd little statements, reports of a case or two, a few useless pages of isolated post-mortem records, and these are sandwiched among incomprehensible statistics and farm balance-sheets. . . . I am quite willing to admit that for the careful treatment of the possibly curable insane, none of you have enough help. . . . I can but partially admit this endless plea of overwork in extenuation of the charge of scientific unproductiveness, that serious symptom of a larger malady. . . . Want of competent original work is to my mind the worst symptom of torpor the asylums now present. Contrast the work you have done in the last three decades with what the little group of our own neurologists has done. You have immense opportunities, and seriously, we ask you experts, what have you taught us of these 91,000 insane whom you see or treat?

"You hold to and teach certain opinions which we

have long learned to lose. One is the superstition (almost is it that) to the effect that an asylum is in itself curative. You hear the regret in every report that patients are not sent soon enough, as if you had ways of curing which we have not. Upon my word, I think asylum life is deadly to the insane."

Paying patients "are placed in asylums because of the widespread belief you have so long, and, as we think, so unreasonably, fostered to the effect that there is some mysterious therapeutic influence to be found behind your walls and locked doors. We hold the reverse opinion, and think your hospitals are never to be used save as the last resource."

Re locked doors and barred windows. "I presume that you have, through habit, lost the sense of jail and jailor, which troubles me when I walk behind one of you and he unlocks door after door. Do you think it is not felt by some of your patients? If it were any use to lock these doors all day, except to save attendants from the need to be watchful, I should not mention the matter, but the precaution is a foolish one, save in rare cases; and if a sane man wants to test his feeling in regard to it, let him get some one to lock him in a room—it may be one he does not care to leave for hours. The effect is strange. He becomes at once uneasy and speculative as to when he will be let out. The idea of loss of freedom annoys him.

"Into one ward I sometimes see open the rooms of people of almost all social ranks. They meet more or less unrestrainedly in the common hall. Do you think the educated and well-bred do not feel this; or, too, the absence of refined table-settings, or the dreadful formality of walls and furniture? They may be queer

enough, but neither their tastes nor manners need be cracked. Then there is the tragedy of the diet.

"A feeling of distrust concerning the therapeutics of asylums is fast gaining ground in the mind of the general public. The medical superintendents are farmers, stewards, caterers, treasurers, business managers, and physicians. . . . It is a grave injustice to insist that you shall conduct a huge boarding-house—what has been called *a monastery of the mad*—and keep yourselves honestly able to move with the growth of medicine, and to study your cases, or add anything of value to our store of knowledge.

"Nurses, male and female, or rather attendants, preside over men and women far better educated than those who watch them.

"It is not a mere well-worked, so-called model institution which I want to see, where routine is perfect and every one is satisfied, and the nice little reports describe the amusements, and the new dairy, and the statistics are there; the whole snug business as monotonously alike as are your asylum corridors. . . . You live alone, uncriticised, unquestioned, out of the healthy conflicts and honest rivalries which keep us up to the mark of the fullest possible competence.

"My fear is that some of you would not change your organisation if you could. Nor does it surprise me that so many are contented and ask no radical alterations. I think I should in time become but formally dutiful if I lived all my days in any kind of hospital. When I go into my clinic or wards, I take with me the fresh air of the outer world, and this is what you want. You ought not to live and sleep in your hospitals at all; you ought to be in contact with the world of sane men, having consultations outside, seeing us and our societies."

Dr. J. L. Billings.—"The asylums have contributed very little to advancement in knowledge as to the causes, pathology, and best treatment of the various forms of insanity in view of the opportunities which their officers have had. . . . I have also observed the fact, which must be familiar to all who regard the progress of pathology and therapeutics of mental diseases, that while the opportunities in this country for the study of these diseases are so vast, the contributions to the science of psychiatry are meagre, when compared to those of the continent of Europe."—(*Journal of Nervous and Mental Disease*, 1894, vol. 21.)

Dr. Charles L. Dana.—"There is a great lack of sound psychological knowledge, and a most dead and hopeless attitude therapeutically towards the patients." —(*Ibidem.*)

Dr. W. H. Draper.—"Our asylums are still constructed and administered on the old idea that their main object is to provide safe and secure retreat for lunatics, and they are not organised in accordance with the demands of modern pathology, as hospitals for the scientific investigation and treatment of the functional and structural diseases of the brain."—(*Ibidem.*)

Dr. A. Jacobi.—"The actual fact is that our asylums have always been more or less gentle and genteel prisons for the mentally sick, rather than hospitals. . . . Recoveries are plentiful in our statistics. From them and from my own experience I know that the same person recovered four or six times from what was styled 'acute mania.' "—(*Ibidem.*)

Dr. B. Sachs.—"Insane asylums are homes for the insane, not hospitals for the treatment of mental diseases. No serious attempt at proper treatment is made."—(*Ibidem.*)

Dr. M. Allen Starr.—"The fault at present is that patients are treated and observed by a set of young men who take such positions for want of something better, usually without skill and training.[1] These men hold the position, do such duties as are assigned to them at first, and later, when they have some experience, have so little scientific ability or literary capacity that they take no advantage of their opportunities for observation, and publish nothing."—(*Ibidem.*)

Nowhere in England is there a professorship such as that held by Krafft-Ebing in Vienna, and it seems as if it will be very long ere we have clinical wards for disorders of the mind (not necessarily insanity in the legal sense), where at the same time nervous diseases are studied, and the official work of an asylum does not obtain. Psychiatry not being studied together with neurology, the alienist is liable to underrate, if not overlook, the physical changes in the patient, and the neurologist the mental changes.

The early stages of insanity— the very first aberrations from the normal manifestation—are not to be seen in this country, for lack of a hospital. When such cases have become certifiable for an asylum the disease has progressed. Moreover, the patient himself, who at first is often conscious of his change, will not consult the physician from fear lest he might advise confinement in an asylum.

In Vienna, as in most continental cities, there are observation-wards where patients can be examined, watched, and treated before they are certifiable. There should be a reception house for mental patients in London, where they could be retained for a limited period before being sent to an asylum.

[1] The Medico-Psychological Association of Great Britain holds examinations and grants certificates to asylum officers.

On this point Dr. Cassidy says: "In justice to us who are engaged in asylum practice, it should be remembered that we are precluded from practice outside our asylums, and therefore precluded from treating that stage of derangement of body and nerves when the mind is balanced between sanity and insanity. The early stage of insanity is almost invariably past before the patient reaches us, and more than one half of the cases admitted are incurable *ab initio*. The stages which I have alluded to when treatment would be most desirable, are now observed and treated by physicians and general practitioners, or in the out-patient department of hospitals. To the specialists go their failures." —(*Journal of Mental Science*, January, 1891.)

Sir J. Batty Tuke, M.D.: "A plea for the scientific study of insanity."

"Utter vagueness exists as to the cerebral conditions in the early stages of insanity—conditions which, I submit, must be attacked by the physician in order to obtain cure. It is to the study of these initial morbid states that we must apply ourselves; they are the originators of symptoms; and, until we understand their nature, treatment cannot be applied, except empirically."—(*British Medical Journal*, 30th May, 1891.)

Dr. Ferrier, F.R.S.: "Beyond the fact that the brain is the organ which is directly or indirectly diseased in insanity, we are yet in the most profound state of ignorance regarding the intimate pathology of this condition.

"Post-mortem examinations reveal morbid conditions as to vascularity, or various forms of degeneration in the nerve-cells, neuroglia, etc. But with the exception, perhaps, of general paralysis of the insane, we have yet to find out whether there are any morbid appearances

specially characteristic of special forms of mental derangement, or, whether there is a definite relation between the locality of the lesion and the symptoms observed."

As far as London is concerned it is only fair to acknowledge the desire of progress, the zeal and energy, shown by the Asylum Committee of the County Council. The establishment of a pathological laboratory is one of its achievements.

In the author's opinion we require not only laboratories for *post-mortem* investigations, but also greater facilities for clinical study, such as is provided for in several of the large towns of the continent. The author, after concluding his studies in England, availed himself of these facilities, and not being blindly opposed to the "localisation-theory," he has succeeded in bringing together the facts presented in this book, which throw fresh light on the pathology of mental derangements, and should bring them, in their early stages at least, well within reach of successful treatment.

DOROTHEA L. DIX (†1887).

"MARIE LOUISE,"
French Anarchist.

Contrast the two heads, particularly as regards their development of the superior part of the frontal lobes, the region of the **altruistic sentiments.** (*See* Chapter VI.)

"No name in connection with reforms in the condition of the insane in the United States is worthy of more honour and veneration than that of Dorothea Dix. Early in the field, never disheartened by the difficulties which beset her path, firm as a rock, yet a lady in all she did, this resolute woman succeeded in not only exposing the once revolting condition and shameful neglect of the insane, but in inducing the State Legislatures to erect suitable receptacles for them. More than this, she encouraged efficient medical men to come forward to superintend these institutions, and exercised her influence in obtaining their appointment. Furthermore, she watched over the hospitals for the insane after their establishment, and promoted their successful working by all the means within her power. Those who would adequately estimate the courage displayed by Miss Dix in penetrating into the dens in which the insane and idiots were once concealed, must read her narrative of cases and her Memorials to the American Government some forty years ago. Her Report shocked the feelings of the community, and aroused sympathy on behalf of the suffering insane for whom she pleaded. State hospitals were built, and she had the satisfaction of witnessing a great reform carried out, although even her powerful influence was unable to induce the authorities to do all that she wanted them to do, the State provision being often very inadequate for the needs of the insane, and numbers being allowed to remain in inferior almshouses. But if the condition of the insane in the United States at the time of her death were compared with that in which she found it, some five-and-forty years ago, the contrast would be at once startling and gratifying. To Miss Dix the change is mainly due."—*Journal of Mental Science*, October, 1887.

CHAPTER II

THE PATHOLOGY OF MELANCHOLIA

WITH THE CLINICAL RECORDS OF 150 CASES, INCLUDING 50 CASES OF INJURY, HALF OF WHICH RECOVERED AFTER OPERATION

1. Introduction.
   Pathology of Morbid Fear and Melancholia —Seat of Lesion in the Brain.
2. Cases of Injury.
3. Of Tumours.
4. Of Inflammatory Disease.
5. Of Hæmorrhage.
6. Of Symmetrical Atrophy.
7. Of Cranial Abnormality and Disease.
8. Melancholia and Psychical Blindness.
9. Experimental and other Evidence.
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    The Skulls of Bach and Beethoven.
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CHAPTER II

THE PATHOLOGY OF MELANCHOLIA

1. Introduction

IN the previous chapter has been demonstrated the possibility of localising the fundamental emotions in circumscribed areas of the cortex of the brain.

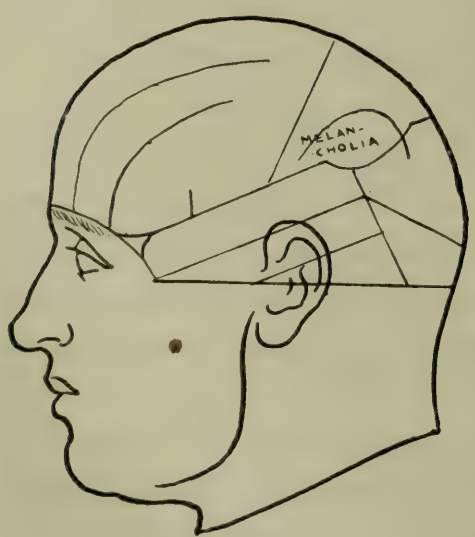
Alienists have never attempted localisation, though they must have noticed that there exist in the encephalon regions the lesion of which nearly always brings about the appearance of the same symptoms. To those clinicists who believe in localisation, a solitary tumour, a simple limited hæmorrhage, or a localised softening would amount to the same for purposes of study as the experiment of excitation or artificial destruction does to the physiologist; with the advantage that the clinical observations would be more trustworthy, since they are made on man, whose mental and physical changes we can test.

Pure melancholia, being an emotional and not an intellectual disease, one is not surprised that JENSEN (*Archiv für Psychiatrie*, vol. 20) found that in this form of insanity the frontal lobes are not affected, in contrast to general paralysis. TIGGES (*Allg. Zeitschrift für Psychiatrie*, 1888, vol. 45) found the same. In

melancholia, he says, the frontal lobe keeps its high weight, whereas in hilarious mania it sinks low, and in general paralysis lowest.

The present chapter deals with the different grades of simple melancholia, especially in its earliest stages. While Ferrier, Savage, Schröder van der Kolk, Tigges, Jensen, and others have surmised that the lesion in melancholia is limited in extent, others there are, like Yellowlees, Fielding-Blandford, Mickle, etc., who adopt the opposite view. Were melancholia an affection of the whole brain, the intellect would necessarily be always involved; whereas we meet every day with melancholiacs who do not exhibit any disorder in their ideas or any lesion of judgment. Melancholia is what Germans style a "Gemüthskrankheit," a morbid condition of the emotional life, affecting an area which is not involved in intellectual processes.

The cases adduced in the following pages show this area to be the parietal lobe, more particularly the convolutions lying under and around the parietal eminence, viz., *the angular and supramarginal gyri.*



To remove any doubt which may obscure the judgment in the testing of these cases, I will at once explain those exceptions in which lesions have been found in other regions than the parietal.

Every one may call to mind cases of melancholia which were found with lesion of the frontal lobes. How are these to be explained? In the previous

chapter it has been shown that the frontal lobes are the centres of the intellect, and as such centres of inhibition of the emotions. In a lesion of the frontal lobes, therefore, the control or inhibitory influence exercisable over the emotions would be lost, and thus a naturally active disposition become morbid. Thus a serious, quiet, gloomy, timorous, or anxious character may now become melancholic, at least at the outset of his insanity. Of course if the patient is demented, as well as melancholic, both parietal and frontal convolutions will be found affected.

Lesions of the occipital lobes may produce symptoms akin to melancholia, but there are comparatively few cases on record, and these will be dealt with in another chapter.

Lesions of the temporal lobes, alone, do not produce *simple* melancholia, but frequently the lesion of the inferior parietal lobule extends into the posterior part of the temporal convolutions, and then produces a new group of symptoms, which will also be described in a subsequent chapter.

Again, sometimes no lesion may be discoverable, and sometimes the whole brain may apparently be affected. Thus we may find a general anæmia of the brain in melancholic cases owing to inanition. In such inanition-melancholias there prevails an intensification of the natural characteristic of the patient; there is manifested a hereditary or acquired disposition to a depressed condition.

Only dispositions which are already leading and highly active in the normal state will become morbid. Thus the modest, humble, apprehensive, and conscientious man becomes the melancholiac and self-accuser. Persons who are of selfish and criminal cast do not in

their delirious utterances reproach themselves, nor express ideas and sentiments which imply that they are especially troubled about their past conduct. The delusion that they have committed the unpardonable sin afflicts only the meek humble Christians who cherish ideas of exalted purity, and who long to attain a holiness of life, yet distrust their capacity, wisdom, and self-control, and are thus led to safeguard anxiously their motives, search their hearts for lurking inclinations to sin, and so drift on into the unfathomable abyss of morbid introspection, which naturally ends in insanity. The ungodly, who pursue deliberately lawless, wicked ways, without pang of regret, are not self-incriminating the moment thought and reason get unrestrained. It is not the dishonest man, the gambler, or the thief, who will, while delirious, confess himself guilty of cheating, embezzlement, and financial frauds; but rather the kind-hearted "Golden Rule" man, who has endeavoured to practice just and upright dealings with all men, and whose generous promptings often exceed his means of benevolence.

The devotee, whose calm, mental conceptions of Providence are offset with vigorous emotional fancies concerning the power and the malignity of Satan, and whose visionary picture of a crystal Heaven, flooded with light and music, is contrasted with another, illustrating a bottomless pit, all ablaze with lurid flames, and stifling with the fumes of brimstone, is exceedingly apt, when insane, to develop religious delusions, so-called, in consonance with such ideas as had most strongly re-acted upon his emotional nature.

It will be shown that the supramarginal and angular gyri are concerned in the production of those morbid psychical and physical states, which we collectively term

"*Melancholia*," of whatever nature the lesion be, and furthermore that the functions, which have been assigned to this area by FERRIER, MUNK, and others as a result of their experiments on animals, frequently co-exist with melancholia, particularly in its earlier stages. Such early stages, however, do not often come under the observation of alienists, and the neurologist, generally speaking, is not wont to notice the mental changes in the patient; or if he does observe them, he is likely to regard the patient's depression, anxiousness, and morbid fears, as a natural outcome of existing physical trouble and not of the particular lesion of the brain. That melancholia is a disease limited to the middle portion of the parietal lobe of the brain was foreshadowed by Gall, who, however, conveyed no details, as he was intent on the discovery of the fundamental faculties in a healthy state, and not in a condition of disease.

2. Cases of Melancholia due to Injury to the Central Parietal Area

In the following pages are cited cases of injuries to the brain affecting the supramarginal and angular gyri, or the meninges covering them, which have been found accompanied by symptoms of melancholia.

Various authors have described a "traumatic insanity." The cases to be adduced will demonstrate that *a single form of traumatic insanity is non-existent.* The form of insanity will vary according to the region on which the injury is inflicted. Though SKAE, MAUDSLEY, and others have declared that melancholia is rarely present in traumatic insanity, the following cases will show that when the injury is inflicted on or about the

middle of the parietal bone, and is severe enough to cause a change in the tissues beneath, melancholia is likely to occur. The possibilities of a contre-coup must, however, be borne in mind.

Of the fifty cases of injury about to be quoted, one half recovered after surgical operation.

G. Mackenzie Bacon.—*Injury leading to Melancholia Operation. Recovery.*—Samuel S., aged 38, a widower with several children, was always in good health, though of nervous temperament. He was a joiner by trade. While at work, and in his usual health, a hammer fell from a height of about six feet on his head. He was not unsensed, nor were any serious symptoms exhibited at the time of the accident; but thenceforth he felt the effects of the blow. Six months afterwards he found himself unable to attend work, through giddiness and inability to fix his mind on anything. A year after the accident he complained of severe pain over the stellate, and adherent cicatrix, which marked the hammer stroke on the left parietal bone, and of aching pains throughout his body. He grew morose and talked of suicide.

In the following months he made a most determined attempt at suicide, by throwing himself over from the staircase at the top of the hospital, where he was then an inmate. His life was saved, and he was sent to Fulbourne Lunatic Asylum. An operation was arranged and Mr. Wherry, who was consulted, removed with the trephine, from the seat of injury, a piece of parietal bone, and found the dura mater beneath of a deep purple colour, but apparently healthy; it bulged, with pulsations, into the wound. The portion of skull removed was three quarters of an inch in diameter, but had not been fractured. The wound healed rapidly and well, and a month later the patient was lively and

cheerful and went to work in the carpenter's shop. Three months after the operation he went back to his old employers. He continued in good health.—(*Journal of Mental Science*, January, 1881.)

Josef v. Maschka (Prague).—*A Medico-legal case of Melancholia.*—A fight occurred at an inn, in which Josef R., 22 years of age, received several cuts about the face, and a severe injury of the right parietal bone, leaving a scar one inch long down to the bone, and showing a depression of the same. Six weeks after, on the last day of the trial, a certificate was read to the effect that the patient could not attend, as he was suffering from symptoms of brain-lesion. After removal of a bone splinter from the parietal wound patient progressed normally, attended the trial of his assailant, and followed again his occupation of a shoemaker. After six weeks a noticeable mental depression overcame the patient, he vomited, had a retarded pulse, and was temporarily hemiplegic on the right side. Notwithstanding a medical certificate, patient, being in the reserve, had to attend military practice in the month following, but broke down on the first day's exercise, had convulsions, which became more frequent, and he died soon after. An abscess was discovered, not under the right parietal eminence, the seat of the injury, but on the corresponding left side, and the forensic experts were called upon to decide whether injury of the parietal bone could cause an abscess in the left parietal lobe, and as to whether a blow with the fist, which the patient was also said to have received on the head, could cause such an abscess. Professor Maschka was in favour of abscess being the result of a contre-coup. —(*Prager medizinische Wochenschrift*, 3rd December, 1879.)

Another Medico-legal case of Melancholia by the same Author.—M. U., a landowner, was attacked by a man with a stone and a scythe, and in addition to injuries on the arm and face, he received a wound on the right parietal bone, 1 inch long and 2 inches broad, cutting the bone, besides the superficial tissues, and depressing the same. The wounds, with the exception of the one on the arm, healed in a fortnight, and the former were, therefore, declared by the medical experts of the court as light ones. Five months later patient was found to have committed suicide, by hanging himself. His widow stated that he had cranial pains ever since the injury, and was confused and distressed.

The post-mortem examination revealed the above parietal wound. The bone was depressed internally, and there was inflammation of the brain tissues just beneath, all the membranes and the brain substance, at that spot, being injected and adherent to one another. All other parts and organs normal. The medical opinion was now given that the cranial wound was a serious one, and able to cause the melancholic change of mind, which led the patient to commit suicide.—(*Collections of Forensic Opinions*, Leipsic, 1873.)

George E. Wherry.—*Operation. Recovery.*—N., an attendant of the Three Counties Asylum, a strong man, aged 25, was sitting in an arm chair, when a powerful lunatic came up from behind, and struck him on the head with a heavy carpenter's mallet. He remained master of his senses but faint from loss of blood. Three days later he had convulsive twitchings down the left side, and on the following day left hemiplegia was manifest.

There was a compound comminuted depressed fracture of the right parietal bone, from the parietal eminence to the sagittal suture. He was trephined. The inner table was found more extensively fractured than the outer, the fragments of skull being deeply depressed and the brain bruised. The exfoliated bone was removed. Next day the wounds unfortunately suppurated. The patient, who, previous to the operation, was **merely anxious** about himself, otherwise calm and intelligent, got **more depressed,** and sullen, and in another month was insane. He had a vacant and absent look. More pieces of bone, which had been exfoliated, were removed, after which operation he spoke rationally and by December recovered sufficiently to engage in farming pursuits.—(*British Medical Journal*, 21st April, 1883.)

William MacEwen.—*Operation. Recovery.*—J. W., aged 28. Seven weeks prior to admission he fell down the slope of a quarry, his head coming in contact with a projecting stone. In this way he received a small wound at the posterior extremity of the left parietal bone, about an inch from the middle line, which gave him little trouble and was soon healed. About three weeks after the accident he began to experience a dull aching pain on the left side of the vertex. He soon afterwards began to suffer from great mental depression, and complained of a sensation of weight in his head. These symptoms continued until his admission into hospital, four weeks from the attack. Here he preferred to lie in bed, as he felt giddy when he moved about. On careful palpation there was discerned a slight tumidity about the cicatrix. An incision

was made across it. The periosteum was thick and somewhat infiltrated with plastic exudation. The cranial bone was inflamed. A stellate fracture of the skull was discovered, with a much-depressed and comminuted internal table, and about four drachms of pus escaped. At the centre of the affected area, the dura mater was covered by a thick layer of granulation tissue, while at its circumference this membrane was flocculent. A fortnight after the operation the wound was healed. The patient's former mental depression and painful sensations had entirely disappeared. A month after the operation he was dismissed well, and twelve months after dismissal he reported that he was in excellent health and attended to his work regularly.—(*Pyogenic Infective Diseases of the Brain*, Glasgow, 1893.)

W. B. Fletcher.—*Operation. Recovery.*—These are three cases of patients who, after an injury to the skull in the parietal region, which left a depression, were suffering from melancholia, and developed suicidal tendencies, yet who, after a simple surgical operation, consisting of a lifting of the depressed tablet of bone, went forth as normal men.—(*American Journal of Insanity*, April, 1886.)

More cases of recovery after trephining for traumatic melancholia by **the same Author.**—W. P. H., 35 years old, fell from a scaffolding six years prior to admission, and exhibited since then strong suicidal tendencies. There was a depression of bone on the left parietal, near the osculation of the right parietal and occipital. He has had epileptic convulsions since the fall. The depression was quite perceptible both to sight and touch. The depressed piece was elevated, and according to Dr. Fletcher, the patient "found to his delight that he was free from pain, and the abnormal mental condition, which had been his constant companion for years, since the moment of his fall from the house top." —(*Ibidem*, October, 1887.)

The same Author.—J. G. of Marion County, Indiana, native of England, aged 47, machinist, was struck on the head by stove-lid lifter three years before admission. He was taken home in an unconscious condition, and so remained for six hours, and confined to his bed for several days. He was soon able to resume work, which he continued to do, after a fashion, for six months. From this time on he became negligent, careless about his clothing, with lack of interest in anything; finally melancholy and suicidal. A careful examination, under chloroform, revealed a scar on the parietal bone, an inch and a half from the coronal suture. The scalp was adherent. On dislodging the surrounding bone, a spicule of the internal table was found, puncturing the dura like a carpet tack. By the seventh day after the operation, the patient was "a new man," as he expressed it. He has been able to continue his work as a stove-moulder from that time, and was reported, two years after his discharge, as being still perfectly well and working at his trade constantly.—(*Ibidem*, October, 1887.)

The same Author.—Henry Stevens, aged 23, was admitted to hospital from prison for melancholia; he never talked nor moved, and sat constantly with eyes turned downwards and lids nearly closed, as if to

avoid the light. A scar ran from the coronal suture backwards over the left parietal bone, two inches long and one inch wide. The bone was depressed to a corresponding extent, and was removed. His melancholia disappeared; he talked, walked, and cared for himself. But another injury, possibly by contre-coup, was supposed, as patient now became morose and profane.—(*Ibidem*, October, 1887.)

The same Author.—M. C., aged 44, was injured during the American Civil War by a fragment of bursting shell, and suffered from melancholy ever since. There was a deep scar one inch and a half long vertically over the centre of the left parietal bone. To the touch it seemed like a groove cut in the bone. The scalp was reflected, but as the bone did not appear depressed, the operation was not proceeded with. The patient, however, improved decidedly; the pain and nervousness disappeared; his general health improved; he became more cheerful, and went to work as a gardener on the grounds.—(*Ibidem*, October, 1887.)

The same Author.—J. N., aged 50, fairly educated, had several children, and, for a farmer, had accumulated a good fortune. Eight years prior to admission he was standing in a saw-mill, when the boiler exploded, a fragment of iron striking him on the upper and anterior third of the right parietal bone. Through this he was unconscious for several days, but gradually recovered, and for seven years pursued his occupation on the farm. Then he got muscular convulsions of face and arm, and at the same time became melancholic, listless, and sometimes suicidal. His friends wanted him committed to the hospital for the insane, but an operation was decided upon instead. There was no fracture at the seat of injury, but the dura was firmly adherent to the bone; it was tough and did not pulsate. On incision two drachms of fluid escaped, and during the next forty-eight hours a large quantity of yellowish fluid. All symptoms disappeared. Patient has been well ever since.—(*Ibidem*, October, 1887.)

The same Author mentions two other cases with suicidal tendencies from injury to the **frontal** bone, probably contre-coup, hence trephining the depressed portion of bone, over the seat of injury, did not improve the patients.

R. Thomsen.—Pieper, watchman, 43 years of age, previously healthy, fell from a cart on to his head and received a wound, which left an adherent scar, 20 cm. long, on the left parietal bone. He went on his way, but on reaching home he suffered from nervous symptoms which caused him to remain in bed for eight weeks. He then tried to resume work, but had to give it up, from a feeling of fear and anxiety, palpitations of the heart and giddiness. There was pain at the seat of the scar. His depression increased considerably and he heard voices, with the left ear only, assailing his character, but was able to distinguish them as unreal and as due to his disease. He saw faces, too, which inspired him with terror. Sent to the asylum, a year after the injury, he was noticed to be quietly behaved, to have an expression of sadness, and there was concentric limitation of the field of vision, with tremor of the hand. He was very anxious, especially at night, and his sleep

was disturbed with dreams, which increased his terror. The excision of the scar was decided upon, but the patient would not consent to the operation and left for home.—(*Charité Annalen*, vol. 13.)

Dr. Koeppe, Halle a/S.—*Operation. Recovery.*—Christian Liese, when 42 years of age, received a blow on the left parietal bone, which deprived him of consciousness, and caused him much headache ever since. Three years afterwards he betrayed much abnormal anxiety about his condition. The following year he made two attempts at suicide, one by hanging and one by cutting his throat. Usually he sat still and listless, but at times he ran about excitedly; the excitement subsided soon and only the symptoms of melancholia remained, for which he was sent to the asylum. He complained of precordial pain and giddiness, sat on his bed with an expression of fear and despondency, declining any conversation. On the left parietal bone, at the seat of the injury, a scar was visible and a small tumour could be felt. On the excision of this tumour, it was found to be a neuroma dolorosum. The wound healed by first intention. Patient became bright and cheerful, declared himself free from pain, and was discharged. He reported himself sometime afterwards as continuing well.—(*Deutsches Archiv für klinische Medizin*, vol. 13.)

Another case of recovery, by the same Author.—Carl Deutsch, 18 years old, received a blow from a stick on the left parietal bone, which caused him great pain. Fourteen days afterwards, when the wound had healed, he became excited with fear, saw danger everywhere, looked anxiously about, sat or lay motionless. He was admitted to the asylum with symptoms of melancholia; he stared about, stood or sat for hours, planted in the most uncomfortable positions, and had frequently to be forced to take his food. When moved to speak at all he burst out crying. He had delusions of fear. On the left parietal bone there was a highly tender scar, one inch long, adherent to the bone. The excision of the scar relieved the patient and he was discharged.—(*Ibidem.*)

H. A. Powell—*Operation. Recovery.*—Depressed fracture of right parietal bone in a girl 8 years of age. Depression and apathy. Trephined seven years after injury, when 15. Became at once bright and cheerful. Under observation two and a half years.—(*Surgical Aspect of Traumatic Insanity*, Oxford, 1893.)

P. Stetter.—*Operation. Recovery.*—Patient, 28 years of age, received an injury some eleven years before, in consequence of a cart horse, on which he rode, shying at a railway train, and throwing him to the ground. The pole of the cart was driven into the lower part of his right parietal bone, and the depression extended to the parietal eminence. He was carried home unconscious. The wound healed readily, but the depression remained. No physical symptoms but striking psychical changes. Patient shunned all associations with men, sat for hours brooding in a corner, had daily paroxysms of weeping, and preferred in the end his bed to getting about. He was irritable, would not obey his parents. These consulted with Dr. Stetter, who decided to trephine. The depressed bone was removed. After the operation patient joined

social life again and became quite normal.—(*Centralblatt für Chirurgie*, 1892.)

Dr. Briggs.—Case of a male patient with depressed fracture of right parietal bone. Gloomy and listless. Trephined five years after injury; did well for a time, but died suddenly.—(*Philadelphia Medical News*, vol. 14.)

Daniel Mollière.—*Surgical treatment. Recovery.*—M. A., aged 40 years, received an injury in the parietal region, close to the temporal bone, which left a scar of 15 centimetres' length. Patient became melancholic, with paroxysms of agitation at night, when he also had alternately incontinence of urine and polyuria. The operation revealed neither fracture nor compression of bone, but an eburnation of the bone with hyperostosis. There was abscess in the brain, beneath the seat of injury; patient improved a few days after the operation, but became hemiplegic on the fifteenth day. It was then noticed that pus was stowed up in the wound. On letting it out, his recovery was rapid. He soon returned to his occupation, which he followed with his former gaiety of spirits, and the letters with which he reported himself to the physician showed him to have kept well, and in possession of all his faculties.—(*Report of the French Surgical Congress*, 1885.)

The same Author.—*Operation. Recovery.*—H. X., 31 years of age, received an injury to his head, which left a scar, in the right parietal region. He became a melancholiac. After trephining the skull, at the seat of injury, he gradually improved, was discharged two months after the operation, and reported himself two years subsequently, as well and working at his trade.—(*Ibidem.*)

George W. Cale.—*Operation. Recovery.*—A carpenter, age 26 years. Family history good. The patient had always been healthy, until receiving a blow from a club, in the hands of a negro. He was hit on the parietal bone, to the left of the median line, about midway between the fissure of Rolando and the external occipital protuberance. Four years after he complained of pain at the spot, and became melancholic, sullen, and morose. The depressed bone was elevated. On recovery he was at once cheerful, and undertook anew a responsible position. — (*New York Medical Journal*, 12th October, 1895.)

Boubila and Pantaloni.—*Operation. Recovery.*—Case of a patient suffering with nervous crisis, hallucinations of sight, and tendency to suicide, which was cured after lifting up a piece of bone, which was depressed, in the posterior parietal region, evidently the result of an injury.—(*Gazette des hôpitaux*, 1892.)

Dr. Fenoglio.—*Operation. Recovery.*—Injury to right fronto-parietal region, followed by psychical disturbances and epilepsy, left-sided paresis and rigidity; gloomy and melancholy. Trephined at the injured spot. **Complete mental recovery.** Symptoms were reproducible by pressure over trephine hole.—(*Bologna Rivista Clinica*, 1887.)

The same Author. — A young farmer, 19 years of age, suffered a depressed fracture of the right parietal bone. The depression measured 63 mm. length, 15 mm. breadth, and 10 mm. depth; it was situated between

the parietal eminence and highest middle point of the temporal crest. Hemiplegia and epileptiform convulsions followed. The previously merry, cheerful patient fell into a sad and depressed mental condition, which brought him to the asylum five years afterwards, in his twenty-fifth year. He was trepanned, and a splinter of bone, which had indented the brain, was removed. After the operation the former hopeful sanguine, joyous nature returned to the patient.—(*Archiv. di psichiatria*, 1884, vol. 5.)

G. Huguenin.—A railway guard, 42 years of age, injured his right parietal bone in a train collision. He lay unconscious for half an hour, afterwards complained of pain in the head, and of great fatigue. On returning to his duties, after eight days, he found the symptoms increasing. The pain got worse, there was a feeling of heaviness in the limbs, inability to concentrate his attention, sleeplessness, giddiness and defects of memory. In course of time mental symptoms appeared, paroxysms of anxiety, in which he wept and cried for hours. Later he attempted suicide on several occasions. He died eighteen months after the accident of œdema of the lungs.—(*Krankheiten des Nervensystems*, Stuttgart, 1880.)

Charles Phelps.—*Gradual improvement.*—Case 278, a male, aged 30 years, fell 25 feet from a ship's deck on to a raft alongside; consciousness was lost for a few moments only; hæmatoma over the right posterior parietal region. Areas of anæsthesia and hyperæsthesia, and contraction of left pupil were noticed and existed on the day of final discharge from the hospital, seven months after admission.

At the beginning of third week delusions of a painful character began to occur, which occasioned the patient much distress. The first trouble which came to him was the fancied death of his wife, and when, a little later, he became convinced that this bereavement was imaginary, he was equally positive that another delusion, the death of his child, was real. This lasted for many weeks. He suffered acute mental anguish in each instance, which could have been scarce exceeded had these pure fancies been actual facts. An inclination to weep was manifested on ordinary occasions, both without cause, as well as when discourse turned upon his family afflictions, but speech was always coherent. At the end of the second month his facial expression brightened, delusions were less constant and of a more trivial character, and the mental condition was less uniformly clouded. In the third month delusions altogether disappeared but mental processes were still slow, and vertigo, which had been an early symptom, still persisted. When patient left the hospital, seven months after admission, there was only a little heaviness of manner and slowness of talk remaining.—(*Traumatic Injuries to the Brain and its Membranes*, London, 1898.)

Dr. Hahn.—Showed at the fifty-fifth meeting of the German Alienists at Breslau a little fellow, Arthur Sch., 10 years old, intelligent, though of weak frame, who for a slight offence had received over the left parietal region a blow with a cane from his teacher. Since then he suffered with headache and had peculiar sensations at the seat of injury.

Five days after the receipt of the injury patient had a paroxysm of fear accompanied by trembling of all the muscles, painful sensations over the heart, and hallucinations inspiring greater fear; he made self-accusations. Two days later came delusions as to his going to be hanged. This condition lasted for five days. He gradually recognised the hallucinations as such, and after about a month he regained his perfect mental stability.—(*Allg. Zeitschrift für Psychiatrie*, 1892, vol. 48.)

S. V. Clevenger.—L., aged 48, mechanic, vigorous, cheerful and industrious, was struck by a flying stone in left parietal region, and within a year became melancholic. He lost all interest in his former amusements, became helpless and sleepless, and presented the appearance of advanced age.—(*Alienist and Neurologist*, St. Louis, July, 1888.)

G. Alder Blumer.—M. D., aged 38, had epileptic fits during thirty-five years. Fourteen years previously he was struck on the right parietal region, where there remained a slight depression. Suicidal tendencies since. Trepanning over the **motor area** did not improve patient's condition.—(*American Journal of Insanity*, October, 1892.)

Schlager described two cases (Nos. 3 and 8) of falls on the parietal bone, followed by headache, amblyopia, depression of spirits, feeling of anxiety, and tædium vitæ. His diagnosis: melancholia.—(*Zeitschrift der Gesellschaft der Aerzte zu Wien*, 1857.)

Paul Schüller.—A. Sch., 26½ years of age, a servant, fell on to her head into the room below, through a floor which had given way. She injured her parietal bone, was unconscious, and had to keep in bed for five weeks. Low spirits, paroxysms of fear and abnormal sensibility were her symptoms thereafter.—(*Psychosen nach Kopfverletzungen*, Leipsic, 1882.)

The same Author.—H. Sch., miner, 29 years of age, had both his parietal bones injured in a fight, leaving scars, and on one side an impression 5 mm. deep. He became melancholic, wept readily and a good deal, and deemed himself badly used.—(*Ibidem.*)

Hermann Demme.—A sergeant-major, received a wound in the parietal region. He became a melancholiac of a very bad type.—*Militärchirurgische Studien*, Würzburg, 1864, p. 75.)

Dr. Azam.—Patient, 33 years old, suffered a contusion of the parietal bone. His character changed. He grew emotional, wept without cause, and became very timid.—(*Archives générales de Médecine*, 1881, vol. 1, p. 129.)

Ludwig Bruns. — A non-commissioned officer, received, in a quarrel with a soldier, several blows with a sword in the left parietal region. He suffered since then from severe headache, giddiness, occasionally got easily fatigued, had sleepless nights, and with attacks of utmost anxiety, without cause. These symptoms increased and developed to genuine melancholia. He attempted suicide by hanging, but was cut down in time. He was brought to the asylum. Phenacetin temporarily relieved his headache, but on his discharge the old symptoms reappeared.—(*Neurologisches Centralblatt*, 1889, p. 123.)

Landerer and Lutz.—W., 46 years of age, received a severe injury to the parietal bone, to which the soft tissues were afterwards adherent.

He commenced with hallucinations of a fear-inspiring nature ; got worse, and was in frequent conflict with the authorities on account of the many assaults he committed, apparently in self-defence.—(*Report of the Private Asylum "Christophsbad" in Göppingen*, 1878.)

Ernst Sommer.— A workman, 29 years of age, was struck by a plate of iron falling on the top of his head, which fractured his parietal bone to the right and nearly parallel with the sagittal suture. Although the fragments of bone were removed the patient remained in a state of complete apathy.—(*Zur Casuistik der Gehirnverletzungen*, Berlin, 1874.)

W. Wagner. — Johann Dudek, 46 years of age, had a fall, which resulted in a complicated fissure of the right parietal bone. He became a melancholiac, and had to be transferred from the hospital to the lunatic asylum.—(Volkmann's *Klinische Vorträge*, No. 271–2, Leipsic, 1886.)

L. Löwenfeld.—J. L., 30 years of age, a single man, was hit by a stone on the right parietal bone, when 13 years of age. Since then the injured part was painful. Patient was low spirited and subject to paroxysms of fear, especially when left alone.—(*Archiv für Psychiatrie*, 1898, vol. 30.)

E. Mendel.—Patient, 36 years old, without hereditary taint, received a knock with a pistol, which rendered him unconscious. Headache. After two years, paralysis of right arm supervened and hypochondriacal delusions. An adherent scar, one inch long, could be felt on the left parietal bone.

Post-mortem. — The dura and pia mater were found adherent to the skull, at the seat of injury, and there was a pseudo-membrane with signs of blood extravasation. The pia could not be removed without damaging the cortex.—*Die progressive Paralyse der Irren*, Berlin, 1880, p. 236.)

C. J. Ellefsen.—Found in a man, 54 years of age, who became melancholic after some heavy blows on the head, hæmorrhage to the extent of about two soup-spoonfuls, over the parietal region, compressing the convolutions.—(*Norsk Magaz. f. Laegevidensk*, 1896, p. 397.)

John P. Gray.—*Renewal of Brain-tissue after Injury.*—The case is that of a man, a soldier, who at the age of 41, in September, 1862, was wounded in the head at the battle of Antietam. The ball struck the posterior part of the right parietal bone, crushing it in, leaving an opening in the skull one and a half inches in antero-posterior diameter, and three inches in the vertical line. The ball was embedded in the substance of the brain. Forty-eight pieces of bone were taken from the brain. The bullet was removed ten days after the injury. He was discharged from the service and pensioned in 1863, and entered upon his occupation, as a turner in brass, the wound having entirely healed over. For five years he remained in good health, without even suffering from headaches. His general health became impaired in October, 1868, and he became depressed and finally developed an attack of melancholia.

He was admitted to the asylum at Utica, 3rd February, 1871, where he remained until 15th February, 1872, having then been well about four months. He was discharged recovered, and returned home and to his work. Nine months afterwards he began to suffer from pain in the head,

and dreading a return of melancholia, he applied, in April, 1873, for an admission order. On 14th June, two months after, he became profoundly melancholic. He gradually lapsed, and died 25th July, 1873.

On post-mortem an elliptical opening in the right parietal bone was found, corresponding to the wound already described. No attempt at bone-reparation had been made. The dura mater extended over the opening, and was firmly adherent to the scalp. It was thickened, and showed signs of inflammatory action. The arachnoid and pia mater were so completely renewed that no trace of the injury could be detected in their structure or by the presence of cicatrices. The convulutions appeared normal.—(*American Journal of Insanity*, April, 1876.)

Wm. Julius Mickle.—*General Paralysis with Melancholia after Cranial Injury.*—A. T., soldier, admitted at age of 29. Serving in the cause of civilisation against the desperadoes of the Paris Commune in 1871, he was struck by a partially spent rifle ball, on the head, just **behind the left parietal eminence,** and lay insensible for several days. Subsequently he entered the British Army, where his intelligence and good conduct gained for him promotion as sergeant. After the promotion he became depressed, melancholy, and careless as to his duties. He became strange in manner, and signs of general paralysis developed. There was no sign nor avowal of venereal disease. Patient wore an anxious, worried facial expression. He died three months after admission.

The necropsy, according to the author, revealed only diffuse changes common to general paralysis of the insane.—(*Journal of Mental Science*, January, 1883.)

Philippe Rey.—*General Paralytic with Melancholia. Operation. Melancholia cured, but not the General Paralysis.* —Patient, 40 years of age, was admitted to the St. Pierre Asylum for symptoms of general paralysis, combined with melancholia, distressing delusions, and terrifying hallucinations. There was a depression in the left parietal bone, size 5 cm., about which no history could be obtained. The depressed bone was elevated, the dura mater excised. The meninges presented a gelatinous appearance with milky spots. After the operation the patient lost his depressing delusions and hallucinations, but the symptoms of general paralysis, defective speech, trembling of the lips, etc., continued, and he died of a diffuse meningo-encephalitis.—(*Report of Alienist Congress*, Lyon, 1891.)

Thomsen and Oppenheim.—*Melancholia with Sensory Anæsthesia.*—W. Schäfer, 49 years of age, family history good, no history of illness previous to accident. While engaged in his work he received a blow on his head from a lever, weighing about 2 cwts. He fell down senseless immediately. The wound he received healed in about six weeks, and left a scar of 4 cm. length on the posterior part of the right parietal bone, with strongly raised edges, and a marked depression of bone. The scar was painful on pressure. Patient suffered since the accident from uncontrollable fear and a sense of giddiness when walking in the open. The slightest noise startled him. When addressed suddenly, he shrank together alarmed, and was unable to utter a word. He was a strongly built, muscular man. He had an anxious face and rigid stare. He seemed greatly oppressed and in a state of continuous sadness. No

paralysis. Sense of touch and pain much diminished, and the visual field contracted.—(*Archiv für Psychiatrie*, 1884, vol. xv.)

The same Authors.—*Another case of Melancholia with Sensory Anæsthesia.*—K. Pöhl, 49 years of age, workman. No hereditary taint. Previously healthy. A weight of nearly two hundredweight fell from an engine on to his head. Notwithstanding the force of the blow and great hæmorrhage patient remained conscious, but was confined to bed for months. He was brought to the hospital four weeks after the accident. There was a scar 7 cm. long on the right side of his head, at the lower inferior angle of the parietal bone, with a depression in the bone. Patient complained of continuous low spirits, and uttered thoughts of suicide. He became very nervous and easily alarmed. His expression was always one of fear, only occasionally more markedly so. There was diminution of all sensibility.—(*Ibidem.*)

W. Wagner.—Alex. Skulla, a labourer, 30 years of age, was hit by a piece of wood in two places : in the centre of the parietal bone, and at the vertex. Scars remained. Patient had an irregular pulse, tottering gait, but no motor or sensory signs. On admission his look was anxious, he fixed objects about him with an anxious eye, and presented the symptoms of melancholia. When asked questions he answered slowly, otherwise he kept silent.—Quoted by Stolper, *Vierteljahrschrift für gerichtliche Medizin*, Berlin, 1897, Part II.

Further cases of melancholia due to injury, and subsequent recovery after operation, will be found in this chapter under the headings "Inflammatory diseases" and "Cranial disease."

3. Tumours in Central Parietal Area Producing the Mental Manifestation of Melancholia

The following cases are those of tumours of the parietal lobes, from which it will be seen that one of the symptoms of the tumours in this region is *depression* varying in degree, from low spirits to morbid fear or melancholy. This would distinguish tumours of the parietal lobe markedly from those of the frontal lobes. Symptoms of the latter, as Oppenheim and Jastrowitz discovered, are hilarity and witticism. Herein we have yet another addition to our knowledge of localisation.

C. v. Monakow.—R., a well-to-do farmer's wife, 53

years of age. No illness up to her fortieth year, when, consequent upon her sister's suicide, she became melancholic. The mental derangement began with depression, self-accusations—she considered herself responsible for her sister's death, etc., but there were no hallucinations. She was then admitted to the asylum, and remained there for six years. The derangement was that of chronic melancholia, without hallucination, with clearness of intellect and complete recognition of her condition. On leaving she suffered only from slight depression.

Seven years afterwards she gradually relapsed, had morbid fears and tædium vitæ. She was re-admitted, and remained in the same condition for four years, when her state became much worse. Her anxiety increased, she hardly ever had any sound sleep, wept and wailed for days together, accused herself of impiety, and deemed this the cause of her illness. Otherwise her intellect was unclouded, and she kept even now free from hallucinations. There was hyperalgesia of different areas in the lower extremities. She died five years after her second admission.

The autopsy revealed two sarcomatous tumours in the left parietal lobe, which had grown together and had perforated the bone. They involved the upper parietal lobule, gyri supra marginalis, and angularis, as well as præcuneus. The neighbouring brain substance of the tumour was strongly hyperæmic.—(*Archiv für Psychiatrie*, 1881, vol. 2.)

Sir W. H. Broadbent.—Clara C., aged 36, a widow, earning her bread as a needlewoman, was subject to convulsion of the Jacksonian type. She was well nourished, but rather pale and having a sad expression. Her vision was almost completely lost, due to advanced atrophy of the optic nerve. She was particularly intelligent, but had become since her illness greatly distressed, very nervous, apprehensive, and low spirited. She often gave way and cried. She had pain in the right side of the head. The emotional depression continued till her death, when two small gummata, size of a split pea, were found depressing the right supra-marginal lobule.—(*Lancet*, 21st February, 1874.)

L. Manouvrier, at a meeting of the Anthropological Society, in Paris, on the 3rd December, 1885, showed a brain of a woman in which there

was a depression, size of a walnut, in the parietal lobe, caused by a fibrous tumour which was implanted in the parietal bone. The patient was 51 years of age when she died, and was an inmate of the Asylum at Orleans for melancholia and tendency to suicide. Intellectually she was normal; her memory and reasoning power were good. The tumour had encroached upon the arm centre, yet there was no sensory or motor trouble of any kind.—(*Bulletins de la Societe d'Anthropologie de Paris*, 1885, vol. 8.)

Dr. Bernhard.—The patient was a woman 63 years old, who for years had suffered with melancholia and paroxysms of anxiety. No other signs of disease. The paroxysms increased in intensity, and patient made suicidal attempts. She had delusions of having animals in her body and lead in her head, of suffering from softening of the brain, of having no abdomen. The left side of her body she thought was drying up, because she cut her wrist there in one of her suicidal attempts.

Post-mortem.—The greater part of the left parietal lobe depressed for about two cm. below its level. The depression was caused by a cyst, the size of a hen's egg, filled with serum, beneath the dura and adherent to it. There were no entozoötic remains to be found therein.—(*Allg. Zeitschrift für Psychiatrie*, 1883, vol. 39.)

E. Mendel discovered in a merchant, aged 37, a melancholiac who sat still all day, moaning and sighing, withdrawing from everybody, not wanting to speak, and having visual hallucinations, inspiring fear, five small tubercles on the pia mater of the parietal lobe.—(*Neurologisches Centralblatt*, 1882, vol. 1.)

Sir James Crichton-Browne.—Patient, M. B., 66 years of age, admitted into West Riding Asylum. Family and personal history good. Patient was one night suddenly prostrated by a stroke, which temporarily deprived him of power in his right arm, and of vision in his right eye. Within a few days he recovered the use of both these organs, but from that time a distinct change was observable in the patient's mental condition. He was at first listless and indisposed, later he became agitated, and was greatly and unceasingly disturbed as to the safety of his soul. Moved by his fears on this account, he would wander about the house during the night, wringing his hands, and would even talk to his relatives about the desire which he felt to put a period to his earthly misery. On admission to the asylum he was depressed in spirits, and felt, he said, as if he were being perpetually upbraided by his conscience for having neglected to seek salvation. His memory was found vigorous, his face expressed pain, he was now restless, sighing, and weeping, and again he was quiet and stolid, taking little or no interest in what was going on around him. All his muscles were tremulous. At the end of a month it was noted that the patient had become more melancholic. When spoken to, he would, in attempting to reply, dribble into an incontinent emotional overflow of tears. He gradually got paralysed on the right side, and grew feebler. He died two months after admission.

Post-mortem.—A cancerous tumour of the brain involving the whole of the convolutions of the left parietal lobe.—(*British Medical Journal*, 19th April, 1873.)

L. Pierce Clark.—J. B., 34 years old, German, married, no hereditary tendencies in the family. His illness began seven months prior to admission with intense depression from being out of employment. He attempted suicide with a razor. When questioned, he replied in monosyllables. His articulation was slow and hesitating, and at times he broke down entirely, becoming emotional and unable to answer questions. Muscular tremor in tongue, facial muscles and hands. Knee jerks increased equally on both sides. He failed rapidly in health. He had mild convulsive seizures, not epileptic, and without loss of consciousness. These were followed by still further depression, the patient refusing absolutely to move. He died in one of these seizures eight months after admission.

The autopsy revealed four sarcomata of the dura mater, all over the right parietal region ; the largest, containing bony and calcific tissue, was about the size of a large hen's egg, yet it did not bulge beyond the cranial surface, hence the non-recognition of the sarcoma before death.—(*Journal of Nervous and Mental Diseases*, May, 1895.)

Th. Sarlan.—Patient, 31 years of age, father of five children, complained of a sensation of pressure in the parietal region, of sleeplessness, restlessness, and fear ; he easily wept, was afraid of becoming mentally deranged, and had the delusion of suffering from Lues. Against the counsel of his medical advisers he subjected himself to an inunction-cure. His anxiety and fear continued to increase in intensity, and one day he made an attempt at suicide. Patient wept a good deal, searched his whole life for possible causes of his misery, and had to be admitted to the asylum, now suffering for five years, for melancholia agitans.

The post-mortem revealed a sarcomatous tumour of the parietal lobe.—(*Allg. Zeitschrift für Psychiatrie*, 1886, vol. 42.)

Czermak (quoted by Griesinger) gives a case of a woman, 37 years of age, with intense pain in the parietal area ; after a year the pain ceased, and she became increasingly melancholic, necessitating, after twelve months, her admission to the asylum. There she lived for over two years, gradually getting demented. She died of pneumonia.

Post-mortem.—Fifty-seven cysticerci were found on the surface of the parieto-frontal area. —(*Mental Pathology*, 1877.)

Th. Zacher.—Emil Hufschmidt, 40 years of age, suffering with melancholia, and weeping for the smallest cause.

Post-mortem.—Two cysticerci in lower part of left parietal lobe.—(*Archiv für Psychiatrie*, Case 3, 1888, vol. 19.)

H. Oppenheim.—Th. B., 57 years of age, suffered with melancholia and hemiparesis dextra for four years. An intense feeling of anxiety persisted the whole time.

The autopsy revealed a cyst, the size of a hen's egg, in the left parietal lobe.—(*Ibidem*, Case 9, 1890, vol. 21, page 577.)

T. S. Clouston.—A hard, gummatous tumour, size of a pigeon's egg, involving chiefly the right supramarginal-convolution and angular gyrus,

which had caused softening of the brain substance around it, and had made a hole in the skull cap, at the summit of the parietal eminence. The mental symptoms were those of depression of spirits.—(*Journal of Mental Science*, July, 1879.)

Philippe Rey records a case of a melancholiac, 23 years of age, who had a fall on the head some six years before, and post-mortem showed a tumour of the inferior parietal lobule.—(*Annales Médico-psychologiques*, 6th series, vol. 7, 1882, p. 70.)

Marot described a tumour, found in the parietal lobe of a patient who had suffered with melancholia.—(*Bullet. de la Soc. Anat.*, 1875.)

Alexander Hood.—J. M., a maiden lady, 48 years of age, suffered, when about 28 years old, from religious melancholia during some months. She recovered. About a year before her death she got afraid when left alone, was much agitated by fear, lost all relish for society, became melancholic, and showed religious despondency, with self-accusation. She spoke coherently, but took no interest in passing events, and remained much in bed.

Post-mortem.—There was found a tumour in the left parietal lobe.—(*Phrenological Journal*, Edinburgh, 1825, vol. 2.)

W. A. F. Browne (Dumfries Crichton Asylum) mentions the case of a man whose right parietal bone was beaten in with a hammer, about an inch and a half from the sagittal suture. After being trephined, he became depressed, melancholic, and made several attempts at suicide.—(*Ibidem*, vol. 12.)

4. Inflammatory Diseases of Central Parietal Area producing the Mental Manifestation of Melancholia

Timot. Riboli.—*Melancholia, Operation. Recovery.*—A woman, suffering four years from melancholia, complained of constant pain on the right side of the head. There was a swelling, size of a walnut, visible on the parietal bone. This was incised, and pus escaped. It reformed and was again opened by the patient accidentally knocking against it. It was then noticed that the bone beneath was necrossed and admitted a finger to the brain, whose membranes were not adherent to the bone. Since this accidental opening the melancholia of the patient disappeared, and after the necessary surgical attention—a closing of the wound having been effected, and no depressing symptoms having returned for half a year,—the patient was allowed to return to her home.—(*Phil. Seb.*, April, 1848.)

F. Lallemand.—M. Thavernier, captain in the army, 42 years of age, after receiving bad news became forthwith deeply melancholic, refusing to speak another word. Softening of the left parietal lobe was found post-mortem.—(*Recherches Anat.-Path. sur l'Encéphale*, Paris, 1830, vol. 2.)

E. Kundt.—H. Michael, 33 years of age, married, always of good humour, changed half a year ago after a sleepless night. Made an

attempt to hang himself, but was rescued in time. He gave afterwards utterance to delusions of melancholia. He believed himself a thief, a bad and a lost man. He was starving because, as he thought, his stomach would not hold food, it being so constructed that it let everything fall through. He died of phthisis.

Post-mortem.—Pia over the parietal lobe was thick, milky, and the brain substance beneath atrophic.—(*Allg. Zeitschrift für Phychiatrie*, 1894, vol. 50.)

The same Author.—K. Peter, 41 years of age, melancholic, with hallucinations about hell.

Post-mortem.—Leptomeningitis of parietal lobes extending to frontal.—(*Ibidem.*)

Albert Rosenthal.—W. K., a gardener, 30 years of age, twice admitted for melancholia.

Post-mortem.—Left parietal lobe much softened.—(*Centralblatt für Nervenheilkunde*, 1st Dec., 1889.)

David Ferrier.—A. B., housewife, married, aged 44, suffering from melancholia. Nine weeks before admission the illness began with restlessness and refusal of food ; she became very low spirited, and was influenced by the idea that her soul was lost, because she had been wicked to everybody. She attempted suicide on three occasions, twice by strangulation, and the other time by concealing a razor with intent, etc. The patient had had two strokes, one ten years previously, and the other three years before admission. On admission she was extremely dejected and miserable, her mind dwelling constantly on her supposed sins and misfortunes. She constantly exclaimed that she had no home, no clothes, and that she would never be able to pay the debts incurred for her food and clothing there. For this reason she refused food. She died six months after admission.

The post-mortem examination revealed wasting and softening of the angular gyrus, and both postero-parietal lobules, with the adjacent area.—(*West Riding Lunatic Asylum Medical Reports*, London, 1874, vol. 4.)

Percy Smith.—R. J. W., a woman, aged 48, in whom were found rather wide spaces in the parietal lobes, suggestive of wasting, besides pallor of the frontal lobes, who had been twice before in the asylum, with stuporous melancholia ; the third time she had become depressed, silent, refused food and was suicidal. She died ten days afterwards of pneumonia.—(*Journal of Mental Science*, July, 1890.)

James Shaw.—A. G., a housewife, aged 46, was admitted with symptoms of advanced phthisis. The medical certificate stated : " Very depressed and melancholic in character. Has attempted to commit suicide, and says she will do so again, as she is tired of her life." On admission, there was left hemiplegia of face, tongue, and extremities. Vision of left eye defective. No hallucinations. Low spirited. She died four months after admission.

Post-mortem.—In the right cerebral hemisphere there was a large irregularly shaped focus of yellow softening, including nearly the whole of the angular and supramarginal gyri.—(*Brain*, 1882, vol. 5.)

The same Author.—Another case of left-sided hemiplegia. Depression with suicidal attempts.

Post-mortem.—A large focus of yellow softening, as deep as the cortex, involving the whole of the right parietal lobe, except the ascending convolution and the posterior half of the superior parietal.—(*Ibidem*, 1895, vol. 18.)

Auguste Voisin and Ch. Burlureaux.—G., a woman, 40 years of age, single, "virgo intacta," now in her menopause, had attempted suicide. On admission hot tears rolled down her face, she was all a-tremble and disinclined to afford any information, until a few days after, when she considered herself no longer ill. A stage of excitement followed, after which she again talked of suicide.

The autopsy disclosed a thickening of the meninges, limited to both parietal lobes, yellow sticky exudation, and injection of the white substance in this region.—(*De la Mélancolie*, Paris, 1880, Case 7.)

The same Authors.—S., a melancholiac, who had made several attempts at strangling himself, and succumbed to an apoplectic stroke, was found post-mortem to have the parietal lobe and adjacent parts hyperæmic.—(*Ibidem*, Case 29.)

The same Authors.—Len., a woman, 33 years of age, hypochondriacal and melancholic, died after an apoplectic stroke.

Post-mortem.—The meninges were found injected and thickened over the parietal convolutions, the subjacent cortex, appeared ulcerated.—(*Ibidem*, Case 57.)

The same Authors.—M., a tailor, 39 years of age. One night, he said, he had a trembling attack, similar to the one he had on admission. His wife noticed that he was growing gradually sad and depressed. On admission his face expressed fear, his limbs, head, and whole body were all of a-tremble. Speech was tremulous likewise. It was difficult to fix his attention. His ideas were those of a melancholiac. While speaking he often gave a sudden start, as though he had received an electric shock. He could not stand firm, his legs being too shaky. For ten days consecutively he passed his time in the chapel, kneeling and praying profoundly. When in the ward he was also on his knees praying. He could not be got to speak when addressed. Gangrene of the knee on which he rested so long set in, and he died.

Post-mortem.—Softening of the frontal and parietal lobes; the latter being found ulcerated throughout their whole extent, and presenting numerous dilated capillaries and blood extravasations.—(*Ibidem*, Case 60.)

The same Authors.—N., a woman, described as a melancholiac, complained of imaginary persecution of a physical nature, and had fifteen attacks per day of a hystero-epileptic nature.

Post-mortem.—Hyperæmia and ecchymosis of the parietal convolutions and the meninges covering them, with a large serous effusion in the sub-arachnoid space.—(*Ibidem*, Case 69.)

The same Authors give numerous other cases of the same nature.

L. F. Calmeil.—*General Paralysis and Melancholia.*—P. had repeated attacks of profound melancholia. The first when 22 years of age;

another serious one six years later, which occasioned his confinement for three months in the asylum at Charenton. Five weeks after his release had a third attack. The fourth, when 38 years of age, combined with an exaggerated self-consciousness or self-esteem; thought himself much above other folks, and carried his head high and his body erect. Still he remained silent, and his expression was one of disdain. Subsequently he rapidly broke down and wasted.

Post-mortem.—The grey matter on the surface of the parietal lobe showed a focus of wasting where it had the appearance as if it had been scooped out.—(*De la Paralysie*, 1826, p. 260.)

Dr. Bourneville.—*Epilepsy, Melancholia, Dementia.*—Ravin, 62 years old, entered Salpêtrière Hospital affected with epilepsy, followed by fits of rage, which necessitated careful supervision. The disease started in his twenty-fourth year, and was caused by a fright. A year later patient suffered from hallucinations, became melancholic, refused food and made several attempts at suicide. In the course of years he got more and more demented, his speech became affected, he grew feebler, and died.

The autopsy revealed, besides lesion of the middle and inferior frontal convolutions, lesion of the inferior parietal lobule of the right hemisphere.—(*Archives de Neurologie*, Paris, 1880, vol. 1.)

C. Gallopin.—K. J., 25 years of age, demented and melancholic; sometimes did not speak for months. Died of phthisis.

Post-mortem.—Besides softening of the first and second frontal convolutions, the gyrus angularis was red and softened and the membranes above it were adherent.—(*Annales médico-psychologiques*, September, 1879.)

T. Kirkbridge.—A case of blocking of arteries.

The author read the notes of a case of a girl who, during a single night, changed from great vivacity and activity into a melancholic condition, her face showing all the indications of intense anxiety. She died on the eighth day.

The autopsy revealed bilateral thrombosis of the middle cerebral arteries which supply the parietal lobes.—(*American Journal of Insanity*, October, 1879.)

5. Hæmatoma of the Dura Mater—False Membranes and Arachnoid Cysts—Producing the Mental Manifestation of Melancholia

A pathological state which has puzzled many eminent observers is the hæmorrhagic effusion so frequently found on the surface of one or both parietal lobes of the cortex, which, if the patient remains alive, organises and forms a false membrane. The mem-

brane may present two distinct laminæ, containing altered blood or serum, forming a cyst. The layer of blood or membrane may be large, and extend towards the front or more frequently towards the base, but the greatest thickness is to be found under the tubera parietalis, thence tapering gradually off.

These hæmorrhages seem to originate in the parietal area, and there are two forms of them :—

(1) The primary hæmorrhagic effusion of pial origin, due to vaso-motor disease, and non-inflammatory in character.

(2) The other, a primary inflammatory change, a circumscribed pachymeningitis interna hæmorrhagica, produced by a violent congestion of the vessels of the pia mater, which occupy the summit of the gyri.

The non-inflammatory form appears to occur oftenest through sudden fright, mental shock, or other severely depressing, emotional disturbance.

The inflammatory form appears to occur chiefly in such mental diseases as may be ushered in through an attack of melancholia, such as general paralysis of the insane.

Both forms appear to be common in long persistent anxiety.

Whenever the effusion or membrane extends beyond the parietal area other symptoms appear.

In support of this clinical observation may be quoted the experiment of Kremiansky of St. Petersburg, who produced artificially a pachymeningitis hæmorrhagica circumscripta in the parietal region of dogs, and observed their mental changes. The animals exhibited morbid fear and for a long time refused food.

Dr. Fröhlich.—C. U., 46 years of age, wife of a manufacturer, suffered from melancholia. She had been

brutally treated by her husband. Her fear and anxiety was intense, she refused all food, considered herself a great sinner, wished herself dead, and made an attempt at suicide. On admission she had delusions of having to die a frightful death, fears of being put in a boiler with seething oil, and of being swallowed by serpents. Pretending to get a breath of fresh air at the window, she, in an unobserved moment, committed suicide by hanging.

The autopsy revealed hæmorrhage under the parietal tuberosities.—*Allg. Zeitschrift für Psychiatrie*, 1875, vol. xxxi.)

Auguste Voisin and Ch. Burlureaux.—Gr., a woman, 34 years of age. Though she never had any serious illness, she suffered constantly with palpitations of the heart and several times fainted in the street. Her mental change dated from the bombardment of Paris, when she became much frightened as to the consequences. Her fears received a further stimulus during the days of the Commune, when she saw the funerals of the victims pass her house, and enquiries were being made after her husband, who had refused to take up arms. For two months her conversation consisted only of one phrase which expressed her fear. She gave up all interest in her household and her work. Hearing the thunder of cannon one evening she grew excited, smashed the furniture, tore her clothes, and attempted suicide by jumping out of the window. After her rescue she refused all nourishment, and being unmanageable, her husband placed her in the hospital. On admission she seemed terribly emaciated. Her face bore the aspect of terror. The physical examination took place with difficulty; both heart and lungs were found normal. Her excitement abated, and she relapsed into a state bordering on catalepsy, had to be fed

with the œsophageal tube, and uttered only a few words of terror. She wasted more and more, and just before her death had another attack of furious excitement. No fever. She died comatose the next morning.

Autopsy.—There was a small subarachnoid cyst over the left parietal lobe. The arachnoid in this region was studded with numerous yellow spots, size of pins' heads, which, on microscopical examination, turned out to be dilated capillaries, filled with hæmatosine granulations, hæmatine crystals, mostly discoloured, and blood globules. —(*De la Melancolie*, Paris, 1880, Case 4.)

The same Authors.—Dus., a woman, 32 years of age, grew emotional about a month before her admission, weeping readily, and lost all interest in her household occupation. The certificate stated her to be suffering from melancholia, to be mute, tired of life, and to have terrifying hallucinations. On admission she was very pale and feeble, no paresis, her right side was insensible to pain. She had several epileptiform attacks in the hospital.

Post-mortem.—A hæmorrhagic effusion over the fronto-parietal region and the grey matter in the middle part of the parietal lobe had a faded leaf colour.—(*Ibidem*, Case 39.)

The same Authors.—R., a woman, 44 years of age, had delusions of having her vital organs torn out and of their being gnawed, also delusions about wealth, also of a religious character ; she kept weeping and had attacks of sadness. These melancholic paroxsyms with mutism alternated with the paroxysms of agitation, which it was found arose from hallucinations of hearing, being called an assassin and thief. She was found in bed one morning dead.

Post-mortem.—There was hæmorrhagic and a hyperæmic condition of the right parietal lobe.—(*Ibidem*, Case 51.)

The same Authors.—R., a needle-woman, 43 years of age, admitted for hypochondriasis and melancholia ; had a pale, sad face, drooping head, and remained motionless in her chair ; spoke slowly, expressing her sadness and her misfortune. She had hallucinations of sight. Had two epileptiform attacks at the asylum and continued agitated with incoherence and difficulty of speech. Temperature, just before her death, 41 degrees centigrade.

Post-mortem.—Subarachnoidal hæmorrhage over both parietal lobes.—(*Ibidem*, Case 59.)

The same Authors.—W., a female news-vendor, 69 years of age, with hypochondriacal delusions that her inside was being burnt. Remained melancholic for ten years and died of pericarditis.

Post-mortem.—False membranes and signs of hæmorrhage over both parietal lobes, extending to the frontal eminences and at the base to the sphenoid bone. The cranium was thick.—(*Ibidem*, Case 65.)

The same Authors.—Mme. Antonelli, when 30 years old, was so disgusted with her life that she made quite a number of suicidal attempts.

Placed in an asylum she grew calm, but was frightened by a fire and never recovered from her agitation till her 45th year, when she died.

Post-mortem.—Pseudo-membrane over parietal lobe, infiltration and injection of the pia mater beneath, erosion of the convolutions.—(*Ibidem*, Case 66.)

Pliny Earle.—A false membrane over both parietal lobes with remains of hæmorrhage was observed in a woman, Mrs. A. M., widow, aged 44, who had been melancholic for over a year. She had once attempted self-destruction. She refused to eat, wanted to be buried, and even when her disease had so far progressed that she was barely able to speak, she wearied herself with self-accusations and anent her destiny. —(*American Journal of Insanity*, vol. ii.)

S. G. Webber.—*A case of Melancholia with Paraphasia.*—Patient was depressed, and was said to have attempted suicide. A double-edged knife was found on his person. Once he had visual hallucinations. His speech improved and he left the hospital. Three months afterwards he was brought in dead, having cut his throat.

The autopsy revealed in the supramarginal convolution a cavity about three fourths of an inch in diameter, filled with dark red serum and crossed by many bands of fibrous tissue.—(*Boston Medical and Surgical Journal*, 20th December, 1883.)

Dr. Brie.—Catharina D., single, aged 36. Five years before her admission she showed the first signs of melancholy ; as cause, was given *rejected love.* Her condition gradually got worse, she took no interest in anything, remained silent, preferably in bed, and when disturbed she was unfriendly.

Post-mortem.—There was in the medullary substance of each angular gyrus, right and left, a hæmorrhagic focus, with softening of the neighbouring parts.—(*Neurologisches Centralblatt*, 1897, p. 2.)

Dr. Amelung.—Christine Ran, 39 years of age, single, hitherto healthy, got terrified at the news that the house in which she lived was on fire. She ran home, arrived perspiring and exhausted, became feverish, and in two days' time developed paroxysms of fear, which necessitated her confinement in an asylum. She died a year after.

The post-mortem examination revealed a pseudo-membrane limited to the right parietal region, with remains of hæmorrhage.—(*Bericht über das Hofheimer Spital*, 1844.)

F. C. Hoyt.—Pachymeningitis hæmorrhagica interna chronica in a patient suffering with melancholia and suicidal tendencies. A blood cyst was found in the right parietal region.—(*Medical Record*, New York, 30th April, 1892.)

Rudolph Arndt.—H. B., 25 years of age, watchmaker, mentally always very bright and lively, was noticed by his parents about six years before admission to change in mood and become melancholy. Mentally and physically he became very inactive ; nothing interested him any more. He sat still the greater part of the day, rarely uttering a word, betrayed an anxious uneasiness, and was ultimately removed to the asylum. On admission his face was found pallid and expressionless,

pupils wide, their reflex-activity poor, extremities cold. The emotional state apathic. He died of phthisis after five years' residence.

Post-mortem.—In this case a pseudo-membrane extended over both parietal lobes. On the left side clear yellow fluid was found beneath the thick membrane, pressing on the brain, and flattening the convolutions.—(Virchow's *Archiv für pathologische Anatomie*, 1871, vol. lii.)

Dr. Seidlitz stated a case of a girl, N., a confirmed melancholiac, who thought herself guilty of many sins, read the Bible incessantly, and asked her parents and Heaven for pardon.

Post-mortem.—There was hæmorrhage over both parietal regions.—(Oppenheim's *Zeitschrift für die gesammte Medizin*, 1841.)

Dr. Joffé.—Patient, a female, 46 years of age, was brought to the asylum on account of intense melancholic depression and many suicidal attempts. The eyes were deeply sunk in their sockets and surrounded by bluish rings, the pupils equally contracted, the look staring, the cheeks pallid and drawn in, the expression one of sadness and anxiety. Hitherto healthy, living in good circumstances. Her delusions were that she had no blood, no intestines, that her inside was empty, and she need not therefore eat. Her soul was lost because she had for a long time neglected to go to church. There was insufficiency of the mitral valves, analgesia of the skin, total apathy, but occasionally active feeling of fear, when she would lament over her condition and give utterance to her delusion. In such a condition she would ask to have her head cut off, to be cut to pieces to end her distress. When asked where she felt pain she pointed over the heart. She obstinately refused food. She died a year after admission.

Post-mortem.—There were pseudo-membranes over the convexity of both hemispheres, and emboli were found, increasing in number from the frontal to the parietal lobes, where they were most numerous. The occipital and temporal lobes, as well as the base of the brain, showed no pathological change whatever.—(*Vierteljahrschrift für Psychiatrie*, 1867.)

Gairdner, Robertson, and Coats.—*Aphasia and Melancholia.*—Mrs. Williamson suffered from a well-marked hemiplegic and aphasic attack. The only exclamation uttered for some time after admission was "Oh dear!" with much moaning. She had several times been moved to tears.

Post-mortem.—There was a large gap in the cerebrum, occupied by a collapsed membrane, which was stated to have contained, at the time of the post-mortem examination, a large quantity of fluid. The parietal lobe was destroyed, the only part present was the posterior half of the superior parietal lobule. The third frontal convolution was destroyed at its posterior part.—(*British Medical Journal*, 1st May, 1875.)

W. Julius Mickle.—*Syphilis and Melancholy.*—A soldier, aged 35, suicidal; not epileptic. Patient was depressed and apathetic; he sat by himself, never spoke unless previously addressed, and took no apparent interest in his surroundings. He was suicidal. Occasionally the patient sighed. The expression was one of sadness and misery. The

obstinacy of the patient as to the taking of medicine and of food was a source of much difficulty in the case.

Post-mortem.—Syphilitic nodes on cranium, four on eacn parietal bone. On the internal surface there was also a thick, yellowish-white, adventitious membrane, rather larger than a five shilling piece, adherent to the bone above, opposite to the right parietal eminence which was superficially eroded. On the left side there was a similar smaller area of erosion, but there the false membrane was firmly adherent to the dura mater.—(*Journal of Mental Science*, January, 1880, Case 5.)

Philippe Rey.—J. E., general paralytic, 45 years old, melancholiac and confirmed hypochonder.

Post-mortem.—Hæmorrhage over parieto-occipital region.—(*Annales médico-psychologiques*, 6th series, vol. 8, Case 2.)

Ludwig Meyer.—John R., 38 years of age, melancholic for seven years. Always depressed, weeping a good deal, and expressing his fear and anxiety.

Post-mortem.—Localised pachymeningitis of the parietal regions with false membrane. Hæmorrhagic infiltration in this region.—(*Archiv für Psychiatrie*, Berlin, 1872, vol. iii., Case 27.)

Joseph Wigglesworth.—*Case of Acute Melancholia.*—A soft, thin layer of reddish-black blood clot, adherent to right parietal region, and extending to the base. Pia mater deeply injected over right angular gyrus and posterior part of superior parietal lobule.—(*Journal of Mental Science*, Case 11, January, 1888.)

D. J. Cunningham has brought forward a case with a large subarachnoid cyst, involving the entire supramarginal and angular convolutions. Patient was much given to hysterical weeping. He was a man of huge frame, and his pituitary body was found enlarged.—(*Journal of Anatomy and Physiology*, 1879, vol. xiii.)

S. Pŏzzi.—Lecrosnier, 64 years of age, melancholic, tried to jump out of the window, saying his last hour had come. He subsequently had epileptiform attacks. On his death there was found hæmorrhage over the parietal region of the brain and œdema of the cortex beneath. —(*L'Encéphale*, 1883, vol. iii.)

F. Lallemand.—Patient, a widow, 54 years of age, melancholic, died on the twelfth day of her admission to the hospital.

Post-mortem.—Localised hæmorrhage over parietal lobe and softening thereof. —(*Recherches Anatomico Pathologiques sur l'Encéphale*, Paris, 1830, vol. i., p. 25.)

The same Author.—Pierre Aubert, 55 years of age, suffered six paralytic strokes within five months. Patient was in a melancholic state, easily excited to tears.

Post-mortem.—There was a false membrane and signs of hæmorrhage in the left parietal region.—(*Ibidem*, vol. ii., p. 237.)

The numerous cases quoted by AUBANEL, of patients who had received sudden mental shocks, may also be referred to. Evidently a raptus sanguinis took place,

for more or less organised blood and false membranes were discovered post-mortem. (*Journal de l'Anatomie et Physiologie du système nerveux*, 1843, and *Annales médico-psychologiques*, vol. ii., 1843.)

Cruveilhier made similar observations.

L. F. Calmeil published a large number of cases of melancholiacs in whom post-mortem were found the remains of hæmorrhage and false membranes. (*Traité des maladies inflammatoires du cerveau*, Paris, 59).

6. Symmetrical Atrophy of the Parietal Bones in Melancholic State of Mind

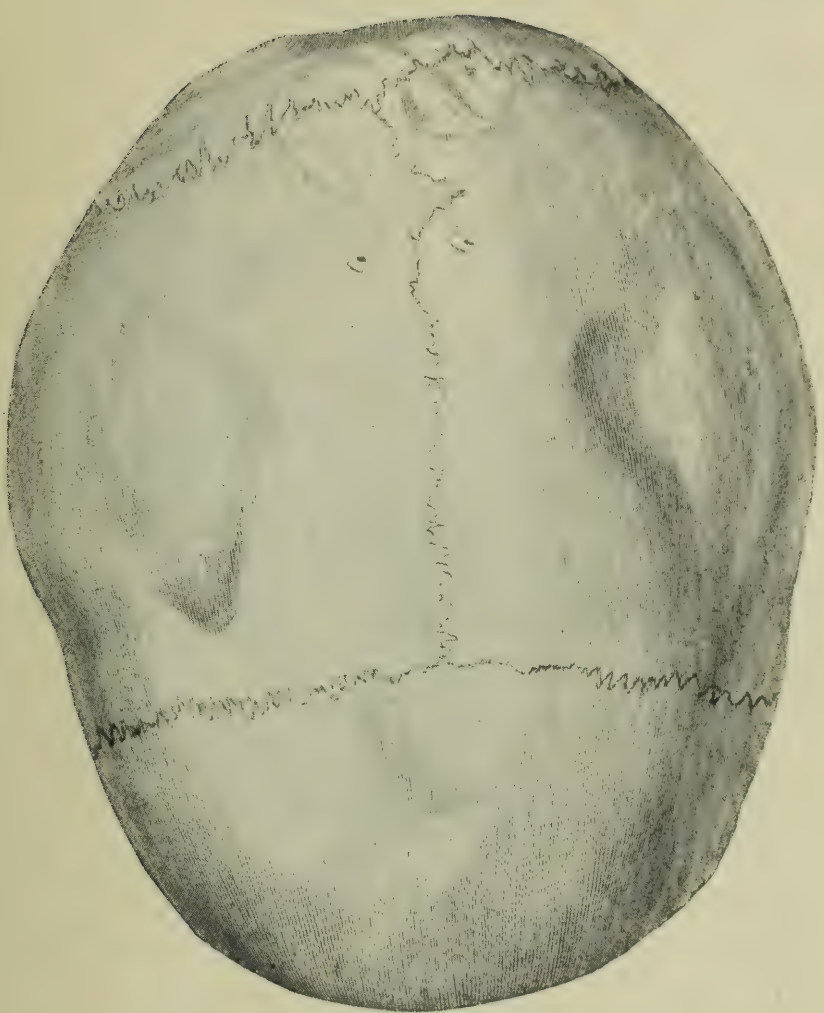
The localisation-theory has helped the author to yet another valuable result. Numerous observers, Larrey, Broca, Virchow, Rokitansky, Maier, Chiari, Féré, George M. Humphry, and others have been in possession of skulls with symmetrical depressions of both parietal bones. There is also one in the College of Surgeons' Museum in Lincoln's Inn Fields. They have described the "naked eye" and "minute" anatomy of these deformities, but were unable to discover the cause. Only cases duly authenticated and well taken are quoted, in all of which a clinical history was obtainable, such history being invariably one of psychical pain or of melancholia.

These parietal depressions commonly exist on the two sides and are symmetrical in position, and more or less so in size. They are some distance on each side of the sagittal suture, if not on the parietal tuberosity itself. The thinning is sometimes so considerable as to produce a hole in the centre. These depressions do not present any indications of being the result of disease, such as syphilis, as Rokitansky has assumed. They are certainly not the result of external influences

or accident. Changes in the circulation alone would not cause in the part such a circumscribed symmetrical wasting. These depressions are not congenital, as Humphry thought, nor is Maier correct in attributing the circumscribed thinning of the skull to senile atrophy. From the cases about to be detailed it will become evident that these localised changes in the skull are due to trophic influences, accompanying the melancholic state, limited as a rule to the parietal bones, or originating at least in them.

H. Schüle.—Mrs. X., a very clever woman and excellent mother, had consulted numerous European specialists about an ear trouble and subjective noises, but without result. As her complaints got worse and were shown to be due to hypochondriacal melancholia, and the old lady of seventy-seven wasted away and repeatedly attempted suicide, so that she had to be watched day and night, her admission into the asylum was arranged.

On her admission it was quite evident that she was suffering from very acute hypochondriacal melancholia. The accompanying physical symptom was an acute neuralgia of the left trigeminus, which on the head was particularly painful and confined entirely to the left parietal bone. In conjunction with the severity of the neuralgic attacks there were most acute feelings of fear, which made her groan and utter cries of lamentation. Sometimes her respiratory movements during these attacks were quick and accompanied by sounds as if she were struggling for air; at other times she seemed to lie half dead with hardly perceptible breathing, as if totally oppressed. The clinical curiosity of this state was, that with the appearance of these symptoms there was connected simultaneously



Skull with Symmetrical Atrophy of Parietal Bones.

and in the same degree growing or diminishing melancholia, which made the patient who had otherwise a strong will, a helpless despairing woman, weary of life and attempting self-destruction. The attacks lasted sometimes for hours, sometimes for days, and were accompanied either by active movements of despair or by passive signs of helplessness.

This state went on for months, when a new symptom arose, a disturbance of sensibility, a painful creeping sensation, confined again to the left parietal bone, exactly to the tuberosity, where there was a trough-shaped depression, perceptible to the touch. If asked for the seat of the pain, patient would always lead the hand of the doctor to this particular region. There was another symptom at the same time; an increasing affection of the vaso-motor system: a blushing of the left cheek and hyperæmic areas of skin corresponding exactly to the points of exit of the cervical nerves. These parts would get suddenly red and as suddenly pale again, the cheek being one moment hot, and as suddenly again cold.

The patient was constantly occupied with her physical condition, and wanted to die. She sought help in another institution, too, then tried home life again, in the hope that the surroundings of her children would bring relief; but all in vain! She returned, and after months of agony, still presenting the picture of hypochondriacal melancholy, she wasted more and more, and died five years after her first admission.

Post-mortem. — On the left parietal bone, corresponding to the tuberosity, there was a depression two inches long and one inch deep, with slowly diminishing edges. The part was so thin that held against the light it was perfectly transparent. The rest of the skull showed hyperostosis and in some places even exostoses, so that the skull resembled a plastic relief-map of mountain-ranges. — (*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874, Case 1.

Rudolf Bloch.—*On Symmetrical Atrophy of the*

Cranium in a Patient suffering with Melancholia. — Patient, 86 years of age, had a round depression on each side of the parietal bone, of 4½ cm. diameter on the right side, and ½ cm. smaller on the left side. Patient was in a condition of mental depression, and bore the indicia of anxiety. Tremulous, slow of speech, hesitation in answering questions. Suicidal history in the family. She suffered until three years previously with boring pains in the brain portion corresponding to the parietal lobe. It was ten years previously that the depression was noticed while combing her hair. Her mother had similar depressions in the cranium. Two weeks prior to her admission, her low spirits increased so much that she made several attempts at suicide, first trying to knock her skull in with a hammer; there was still an open wound; and a day later with a knife, which latter attempt was prevented in time. Patient's intellect appeared normal. She admitted having been low spirited, sad, and anxious, but denied having fostered suicidal thoughts. Her painful expression altered but little when she spoke. There was always a long pause between question and answer, and each word and syllable was uttered as in a plaintive mood. She wrung her hands despairingly at times.

Later on it was ascertained that she had been in the institution some thirty years before, and on looking up the documents it was discovered that she was then treated for her state of fear and depression and boring pains in the head, and that she then shortly before her admission had made four attempts at suicide, two by drowning, one with a pocket knife, and one with a razor.

She was, on admission, 86 years of age, and no in-

tellectual defect could be discovered. The diagnosis made was "Melancholia." She died shortly afterwards.

Post-mortem. — An examination macroscopically and microscopically showed that in the thinned cranial parts the lamina externa and diploe were completely absent, whereas the lamina vitrea appeared unchanged at the borders, which were thickened to the extent of 1 cm., the diploe were heaped up, and there was hyperostosis of the lamina externa. The foramina were normal, and the walls of the meningeal artery were also sound.—(*Prager medizinische Wochenschrift*, 1897, No. 13.)

R. Virchow showed at a medical meeting at Würzburg, in 1854, the skull of a man whose chief symptoms besides pain and giddiness were intense melancholy, and whose facial expression had been observed to be always one of supreme sadness. On both parietal bones, exactly corresponding to the eminences, the bone was so thin as to be perfectly transparent when held against the light. Dr. Virchow described the morbid histology of this affection minutely in the *Verhandlungen der Phys. Med. Gesellschaft zu Würzburg*, 1854, vol. 4.

Ludwig Meyer.—C. Th., 44 years of age, single, became melancholic in his 41st year, it is said through *disappointment in love.* Hypochondriacal delusions of changes in his own body, effected by women. Repeated paroxysms of fear, with a tendency to self-mutilation—one attempt, cutting his veins in neck and at wrist, nearly caused his death. On admission he wailed and moaned over his supposed misery. Had attacks of acute fear. He died of phthisis.

The autopsy revealed atrophy of both parietal eminences.—(*Archiv für Psychiatrie*, Berlin, 1872, vol. 3, Case 20.)

Dr. Rossbach.—Patient, aged 58 years, was healthy up to her 24th year. Then after a great sorrow, over the death of a child, she felt severe boring pains in her head, and soon a depression the size of a coffee bean was noticed about the parietal eminence. The depression increased in size during the thirty-four years, and there was now also one on the other side, and she had become also more emotional. At the time of consultation the depressions were 10 cm. long, 1 cm. broad, and 1 cm. deep. —(*Deutsches Archiv für Klinische Medizin*, 1890, No. 46.)

The same Author.—At the annual meeting of the German lunacy specialists in 1889, showed another patient with symmetrical atrophy of the parietal bones, which commenced after severe mental anxiety.

The **Journal of Nervous and Mental Disease,** vol. vii, 1890, p. 120, contains the record of a case of "wasting of outer table of parietal eminence" in a **melancholic** man.

W. Fraenkel. — S., 45 years of age, suffering with melancholia, had atrophy of both parietal bones. The depression on the left had thinned bone at the bottom; the one on the right had a large foramen.—(*Allg. Zeitschrift für Psychiatrie*, 1877, vol. 34.)

Dr. Kirchhoff.—Durbahn, a burglar, became melancholic and had hallucinations.

Post-mortem.—There was atrophy of the left parietal bone. —(*Ibidem*, 1883–84, vols. 39–40.)

H. Voppel. — An imbecile, 52 years of age, timid, avoiding company and resisting interference. There was a deep round depression in the left parietal bone.—(*Allg. Zeitschrift für Psychiatrie*, 1857, vol. 14, Case 39.)

7. Cranial Disease and Congenital Abnormality of Central Parietal Area accompanied by Melancholic States of Mind

Henry Handford.—*Parietal Osteoma treated by trephining. Improvement.*—A young woman, aged 19. No history of syphilis in parents or herself. No injury. Little headache. Right eye : visual field extremely contracted. Left eye : no perception of light. Both optic discs atrophic. Visual hallucinations in the left half of the visual fields. Patient was very emotional. There was a lump, size of half a duck's head, over the right parietal bone. Scalp moved over it. Mr. Anderson trephined over the site of the tumour, two inches in diameter, and removed a disc of bone one inch thick. The bone had projected as much internally as externally, so that upon removing the bone the brain and membranes appeared depressed. Convalescence was rapid, no further headache, sight better, and mental condition much brighter.—(*British Medical Journal*, 11th March, 1899.)

M. Gamberini.—*Exostosis due to Injury. Melancholia. Recovery.*—A banker, 34 years of age, fell from a height on to the left parietal bone. He had severe headache subsequently, and epileptiform attacks, first slight, then growing in severity and frequency. The patient's expression was one of sadness and anxiety ; he had a fixed stare. Later on the pain seemed to be most intense at the spot of the injury. An examination was made of the scalp and a bony swelling, described as an exostosis, was discovered there. The possibility of its being of syphilitic origin was borne in mind and under proper treatment it actually disappeared, and with it the melancholia and epileptiform attacks.—(*Bulletine delle scienze mediche di Torino*, April, 1848.)

W. Julius Mickle.—O. D., a soldier, aged 37, syphilitic periostitis of the right parietal bone. Tenderness on pressure over both parietal bones, and nocturnal pain in these regions. Whilst at Netley patient was desponding and melancholic and of a suicidal tendency. He recovered under treatment. (Later on the disease affected the temporal region, and symptoms of persecutory mania developed.)—(*Journal of Mental Science*, October, 1879, vol. 25.)

M. Rivet.—The patient, 24 years old, was admitted into the Salpêtrière Hospital for melancholia and a tendency to suicide. His health was otherwise good. He was unamiable, easily excitable, could not sleep at night, and would not let others sleep. He constantly threatened to kill himself, and made an attempt while taking exercise in the yard. His ill-humour was without apparent cause. He did not complain of headache, and had no signs of convulsions or paralysis. His head was

abnormally large in the parietal regions. The sutures were well formed; the ossification complete. He died of phthisis.

Post-mortem.—His skull was remarkable for its bilateral enlargement across the two parietal tuberosities, which on examination were found quite thin, hardly a centimetre in thickness. The convulutions were flattened in these regions.—(*Bulletins de la Sociètè anatomique de Paris*, 1887, vol. 2.)

Dr. Tacheron.—Marie Montprivé, a domestic, 33 years of age, depressed, easily moved to tears. Cancerous exostosis of left parietal bone.—(*Rech. anat. path. sur la méd. prat.*, 1823, vol. 3.)

H. Voppel.—An imbecile, 27 years of age, of melancholic type with suicidal tendencies. He had a very large head, the size being increased by the great dimensions of the posterior part of the parietal bones, which bulged, while the forehead was quite narrow.—(*Allg. Zeitschrift für Psychiatrie*, 1857, vol. 14, Case 13.)

The same Author.—An imbecile, 28 years of age, terrified by being attacked one night by a vicious dog; he fell into a stupor melancholicus; was in constant anxiety about his future fate. The left parietal bone was bulging greatly, and showed more grooves on the internal surface than the right.—(*Ibidem*, Case 19.)

The same Author.—A deaf and dumb imbecile, 23 years of age, timid and fearful, avoiding company. There was a protrusion of the left parietal bone.—(*Ibidem*, Case 35.)

The same Author. — An imbecile, 24 years of age, timid and fearful, avoiding company, resisting their approach violently. Bulging of both parietal regions.—(*Ibidem*, Case 37.)

8. Cases of Melancholic States of Mind combined with Psychical Blindness and Word-Blindness

The next cases are such as have shown symptoms not only of different degrees of melancholia, but in addition the symptoms attributed to the angular and supramarginal gyri by other observers, viz., *word-blindness* and *psychical blindness*. The melancholy need not persist; there may be only a sudden, strong, depressing emotion at the outset, which is followed by "word-" or "psychical" blindness. Charcot described the first case; he was followed by Cotard. A very good case is the one recorded by William MacEwen.

J. M. Charcot.—*Psychical Blindness, Word-Blindness, and Melancholia.*—X., a Viennese merchant, who

spoke German, Spanish, and French, and was well acquainted with Latin and Greek, who had a splendid visual memory for words, inherited from his father (a professor of Oriental languages), also a visual memory which enabled him to recall all persons and objects once seen, and a splendid memory for figures; he could furthermore draw, well remembering every detail of landscape. On the other hand his auditory memory was defective, and he had no ear for music.

About a year and a half before consulting Dr. Charcot, patient had *great anxieties* about some debts, which he thought he might not be able to pay. He lost his appetite and could not sleep. When, after all, his financial worry proved groundless, his worry and anxiety did not cease, but went on for a whole year, during which he continued *apprehensive without any reason*, until one day he perceived a great change in himself, which made him think he was going mad. He was already very nervous and irritable. Although he could see everything as before, he had lost the optic memory for forms and colours; this only increased his anxiety. Whenever his business called him to a town which he had been in the habit of visiting, he now felt as though he were in a new town, not recognising the streets, buildings, or monuments. Only after staying some time could he recollect them anew. He could not figure to himself objects mentally. He could not draw from memory any longer. He could not remember the form and features of his wife and children. In addition he had a certain degree of word-blindness. The examination of his eyes revealed no change. He trained his memory afterwards by his auditory impression, repeating words aloud.—(*Le Progrès Médicale*, 21st July, 1883.)

Dr. Cotard.—*Psychical Blindness and "Anxious" Melancholia.*—M. P., 68 years, diabetic, came first to the asylum in 1872, when suffering from *melancholia.* He was in a continuous state of fear and apprehension, and refused food. He believed himself ruined, incapable, and wished to end his life. Sometimes he sat quite motionless; at other times he would walk up and down the room repeating that he was the most unfortunate man in the universe, that he was lost, that he would never recover. It was extremely difficult to get him to dress himself, or to perform the most necessary acts of life. Yet in February, 1873, he had so far improved that he was permitted to join his family at home. He returned in 1881 with the like symptoms of anxious melancholia, with similar illusions, only more intensified. He thought himself totally incapable, devoid of energy, or intelligence, and possessed of all possible miseries. By November, 1882, his hypochondriacal ideas had still further increased. He now asserted that he had no blood, that his whole body was rotten, that he was going to die, that he was already dead. For several months he had complained that he could not represent mentally the objects with which he was formerly quite familiar. Thus, he could not remember a single picture of the town in which he had been living for a long time, and every shop and house of which he knew formerly, and could picture them to himself with closed eyes. Even the face of his wife he could not wholly call to mind, and sometimes it seemed to him to have quite vanished from recollection.—(*Archives de Neurologie*, Paris, May, 1884.)

Wm. MacEwen.—*Psychical Blindness. Melancholy. Operation. Recovery.*—A man who had received an injury a year previously, suffered from deep melancholy,

strong homicidal impulses, relieved by paroxysms of pain in the head of indefinite seat. Though the pain was excruciating, he welcomed it, as it temporarily dispelled an almost irresistible impulse to kill his wife, children, or other people. Prior to receiving his injury he had been quite free from all impulses of the kind, and had led a happy life in his family circle. There were no motor phenomena, but on minute enquiry it was discovered that immediately after the accident, and for about two weeks subsequently, he had suffered from psychical blindness. Physically he could see, but what he did see conveyed no impression to his mind. He was word-blind as well. These phenomena gave the key to the hidden lesion of his brain. On operation the angular gyrus was exposed, and it was found that a portion of the internal table of the skull had been detached from the outer, and had exercised pressure on the posterior portion of the supramarginal convolution, while a corner of it had penetrated and lay embedded in the angular gyrus. The bone was removed from the brain and re-implanted in proper position. After a while he became greatly relieved in his mental state, though still excitable. He made no further allusion to his homicidal tendencies, which previously were obtrusive, and is now engaged at his occupation.—(*Lancet*, 11th August, 1888.)

C. S. Freund.—*Word-Blindness, Psychical Blindness, and Melancholia.*—Carl Schluckwerder, 57 years of age, suffering with word-blindness and psychical blindness. The mental state is described by Dr. Freund as follows :—

"However the moods of the patient may vary, one expression predominates over all others, and is perceptible whether the features are at rest or in motion. It is the expression of anxiety. The patient looks helpless and in fear. He distrusts every person who is talking to him, and even to his own physicians he speaks but little and that guardedly ; only when completely assured of the friendly feeling which the visitor entertains towards him, does his reserve give way, and he then talks as

freely as his defect will allow him." Patient was very emotional, crying easily without sufficient cause.

Post-mortem.—A sarcoma involving the white matter of both parietal lobules was found.—(*Archiv für Psychiatrie*, 1889, vol. 20.)

By the same Author.—A second case of optical aphasia and psychical blindness, in which the cortex was atrophied in that particular locality. It illustrates still better the two functions of psychical blindness and the emotion of fear.

Carl Kellpap, 68 years of age. Most noticeable were his constant sighs, groans, and lamentations, without any reason, certainly not from pain. His face and his whole demeanour expressed helplessness and perplexity. His surroundings seemed strange to him. He seemed psychically blind, and he did not know where he was. He did not understand that he was being medically examined, but looked at the physicians as his enemies, against whom he must defend himself. He was in fear to leave his bed, and when he did get out he moved about with the utmost caution. No paresis, however. He sat brooding, a picture of absence of all will-power. After three weeks his weeping, sighing, and moaning still continued.—(*Ibidem*, p. 371.)

G. Anton.—*Symmetrical Lesion of both Parietal Lobes, Psychical Blindness, and Catalepsy.*—P. J., 67 years old, psychically blind, felt lost, could not find the door or bed, moved about slowly, seldom spontaneously. Cataleptic appearance, staring expression, almost like a mask, the facial muscles rarely moving. The parietal areas of the skull were tender on percussion.

Post-mortem.—A neuroglioma was found, occupying the medullary layer of both parietal lobes.—(*Wiener klinische Wochenschrift*, 30th November, 1899.)

A. Chauffard.—*A Case of Cerebral Blindness, Deafness, and Catalepsy.*—Male, aged 44, dropsical, became aphasic, without preceding symptoms and without loss of consciousness. The next morning he was found in a cataleptic state. He sat on his bed motionless, his eyes fixed, pupils dilated, apparently lost in meditation ; he was spoken to, shaken by the shoulder, but appeared to be unconscious of what was going on around him. A month later the patient was still a perfect stranger to all that surrounded him. He remained silent, only muttering.

Post-mortem.—There was a focus of red softening of circular form. almost the size of a five-franc piece, occupying the inferior parietal lobule.—(*Revue de Médecine*, November, 1881.)

9. Experimental, Anatomical, and other Evidence

At the basis of melancholia is the " emotion of fear." We have seen the frequency of lesion in melancholia in the supramarginal, angular, and neighbouring gyri. We observed also that the function attributed to this

area by MUNK, *i. e.*, psychical blindness, frequently co-exists with melancholia. What we shall demonstrate now is that excitation of the same area, and destruction of it, causes excitation or loss of fear respectively.

Fear is an all-pervading emotion affecting the whole body and exercising its influence over the entire brain, but those who argue that for these reasons fear cannot be localised forget that impulses of the brain, different in kind, must—if there be anything like order—travel along different nerve-paths, and though the effect of such an impulse may be an all-pervading one, there must be one spot from which the impulse starts.

This emotion exists in men and animals, to avoid danger and to save themselves. It is necessary for the self-preservation of the animal, and has for its object the withdrawal from danger. This must happen automatically, else it is useless. There is often no time for reflection. The emotion of fear arises from the retentiveness of pain suffered, which is stronger in one man than in another. Co-ordinated with the intellect this emotion is the foundation for prudence, foresight, circumspection, caution. These latter dispositions are complex. The emotion of fear, however, is a simple state, and when morbid, as in the different degrees of melancholia, should, if localisable, be accompanied by a change in the limited area of the brain cortex. That this is the case, we have seen.

1. Excitation of the lower extremity of the ascending parietal convolution, the area which DR. SAVAGE observed to be frequently connected with melancholia and hypochondriasis, results in a "Retraction of the angles of the mouth," through contraction of the platysma myoides muscle, the same muscle which was observed by Darwin and Sir Charles Bell to contract

strongly under the influence of fear: while Duchenne called it the *muscle of fright.* The drooping of the jaw may be observed in melancholia as well as in fear. It gives the face an elongated appearance.

Th. Ziehen of Jena described three cases of paralysis of those branches of the facial nerve which go to the mouth, with the accompanying mental symptoms of melancholia. This is one of the cases:

K. L., who became affected with severe melancholy after a great fright. Treatment benefited him, and he remained well for eleven years. After the death of a child he became again mentally ill, and on account of his paroxysms of fear, in one of which he attempted suicide, had to be transferred to the psychiatrial clinic. Here he presented a type of severe melancholy without even the slightest intellectual defect. There was an increase of the superficial and deep reflexes. **With the increase of his anxiety there appeared also a paresis of the facial nerve branches to the mouth,** sometimes on the right side, sometimes on the left, both when at rest and when actively innervated. The intensity corresponded to the degree of his anxiety. Patient got well after a month, melancholia and paresis disappeared.—(*Berliner klinische Wochenschrift*, 27th June, 1887.)

2. The expression of "apprehension" consists of a movement of the head from right to left, followed in the expression of anxiety by rocking movements, backwards and forwards. These movements were observed by Darwin, together with contraction of the eyeball, at the mere expectation of injury, as in timidity. In "circumspection" (the looking around for danger, vigilance), which arises from a co-ordination of the emotion of fear with the intellect, we observe a rolling of the eye from side to side. All these effects can be produced by excitation of the angular gyrus. Ferrier gives the result as "movements of the eyes to the opposite side, sometimes also the head, with contraction of the pupils and a tendency to close the eyelids."

3. Hermann Munk (*Ueber die Functionen der Grosshirnrinde*, Berlin, 1881) destroyed the area in question.

When the dog had recovered from the effects of the operation "the sight of the whip, which had formerly frightened the animal away to a corner, had now not the least terrifying effect" (page 29). The dog could see the whip, but was no longer frightened of it, for it had lost its significance to him. A monkey, similarly operated, who was "previously a spirited, lively, and active animal, now hovers in a corner, immobile and apathetic. Even when taken out of the cage he will not move, and if brought to do so by blows, he has a non-perception of obstacles and dangers, so that he knocks against everything, falls from the table, etc."

Similar results were produced by Ferrier. The animal "would not stir from its place," "paid no attention to threats," and when forced to move, "it ran its head full tilt against everything that came in its way."

Moleschott, of Giessen, noticed that immediately after destroying in pigeons the portion of brain corresponding to the parietal lobes in man, they showed a total imperception of danger.

4. The central parietal area seems to have a special connection with the vaso-motor nerves. In melancholia, as in fear, the activity of these nerves is increased, hence increased tension of the arteries, increased blood pressure, pallor of the body surface, cold extremities and præcordial distress. For this reason a drug which dilates the vessels, as amyl nitrite, has been found to give at least temporary relief. Meynert, Hoestermann, Otto Berger, Schramm, and others have used it in the therapeutics of melancholia.

A. Eulenburg experimented on the superficial parietal region of the brain in dogs, and produced irritation of the vaso-motor nerves. Other experimenters had shown that simultaneously with the appearance of

fear, fright, or anxiety, the blood pressure rises owing to a contraction of the arteries over a large area, and continues to rise according as these mental states increase in intensity. I need only refer to CRAMER'S experiments "On the blood pressure observed during the anxious attacks of melancholiacs" (*Münchener Medizinische Wochenschrift*, 1892). Cramer found that whereas the average blood pressure in normal man is 152 mm. Hg., it falls in cheerful people to 145 or 140 mm. Hg., and rises in anxious patients to 160 mm. Hg., and in the very anxious to 180 mm. Hg.

5. It is through the connection of the central parietal area with the sympathetic nervous system that melancholia is so closely concerned with our unconscious vegetative life. So long as the internal organs perform their functions normally we have no sensations of them; when their functions become disturbed we receive a sensation, such sensation being a "painful" one. Joy is never connected with visceral sensations; it can only take place when these are abeyant. According to the greater supply of sympathetic nerves that go to the visceral organ the greater is the liability to depressing emotions. Hence the heart in fatty degeneration of its substance, and calcareous degeneration of its arteries, may give rise to very great depression of spirits and often to agonies of anxiety and terror. The lungs receive but a small supply of sympathetic nerves, hence the destruction of even larger portions of their tissue rarely gives rise to low spirits and never to extreme depression. The suprarenal glands receive an extraordinarily great supply of these nerves, and hence in Addison's disease of these bodies there prevails from the very onset languor and low spirits, and as the disease advances attacks of extreme terror become common.

Next in rank stand the sexual organs, more particularly in women, where the organs are concealed and have therefore a comparatively smaller supply of the cerebro-spinal nerves. After these organs must be placed the stomach, liver, kidneys, and the whole intestinal tract.

Probably it is to the sympathetic system in addition to the effect of the general anæmia, that the alteration of nutrition in melancholia must be ascribed. The rapid loss of flesh, the early appearance of greyness or baldness, the furrows on the forehead and face are the result of atrophy. People who live sad lives die early; fat and jolly go together. Fretting makes thin, whereas a convict may grow fat even on prison fare, simply because his doom is sealed and he has no anxiety.

6. We know that the sensory fibres pass into the cord by the posterior roots, and reach by diverse paths the posterior third of the internal capsule, whence they pass to the parietal region, an area which Flechsig calls "Körperfühlsphäre," translated by Sachs as: "somatic sensory area."

Pierre Dhem finds (*Disturbance of Sensibility in Melancholia*, Paris, 1896) that disturbances of sensation are the rule in the course of melancholia, whether the form of the disease be of the depressed, agitated, or dull type. There is one disturbance of sensation which is constant, viz., the loss or considerable diminution of tactile sensibility over a greater or less surface. The analgesia is often so extensive as to leave but a small portion of the surface healthy.

Tactile anæsthesia, without paralysis, has been noted in lesions of the supramarginal lobules by Dana.—(*Journal of Nervous and Mental Diseases*, October, 1888.)

Bechterew of St. Petersburg believes from his ex-

periments on dogs that cortical centres for touch, sensibility, and the muscular sense really exist on the surface of the hemisphere behind the median gyri in the parietal lobe. After destruction of these parts there were marked alterations of sensibility, and he found that lesions of particular parts induce derangements of (1) feeling of touch alone, or (2) of the muscular sense and (3) of sensibility to pain. The centres are believed to be situated in the angular and supramarginal gyri. —(*Neurologisches Centralblatt*, 1883.)

7. A second sensory system consists in the fibres passing from the lateral nucleus of the optic thalamus into the same somatic sensory area. Déjérine found (*Soc. de Biologie*, 20th February, 1897) that when the parietal lobe, and more particularly the angular gyrus, are diseased, the pulvinar and posterior portions of the external nucleus of the thalamus undergo degeneration. Ferrier surmises that the sensory fibres pass through the optic thalami on their way to the cortex, so that when they are destroyed insensibility of the opposite half of the body is produced.

8. Gall, who discovered the roots of many of the cranial nerves, including the real roots of the optic nerves in the anterior part of the corpora quadrigemina (supposed in his time to be in the optic thalamus), found fibres converging from these bodies to the central part of the parietal lobe. Hence the frequency of disturbances of vision, particularly contraction of the visual field in sudden depression, fear, fright, shock, as in traumatic neuroses, and the visual hallucinations in melancholia. It is important to observe that in almost every case of bilateral concentric limitation of the visual field psychical symptoms are present, most often depression of spirits, feelings of apprehension, easy excite-

ment to terror. It occurs in forms of hysteria whose exciting cause was fright, and in such patients whose illness is dated from the time of a certain "shock."

10. Flechsig on the Central Parietal Area

With all this evidence it would certainly appear as if the angular and supramarginal gyri were in some way connected with those rudimentary feelings, which, when morbid, give rise to melancholia. Unfortunately Professor Flechsig of Leipsic locates in this region a complex sense, which is in no way related to the function which I attribute to it. Flechsig locates the sense of music in the supramarginal gyrus. When it is shown how he arrived at this localisation no one will wonder that I attach no importance to it; and I should not mention the fact here had I not heard an eminent colleague announce it in a lecture at the Royal Institution as a discovery.

Dr. His, Professor of Anatomy of Leipsic University, called the attention of Professor Flechsig to his observation that both Beethoven and Bach had highly developed parietal protuberances. Their enormous development in two such eminent musical composers, Flechsig suggests, would justify us to look in the subjacent gyrus supra-marginalis for one of the essential factors of musical ability.

This is all that Flechsig can plead for his localisation. Excessively large parietal protuberances observed in two heads. What is this but phrenology? Not even the phrenology of the early founders, but the worst form that can be imagined. The combined collections of Gall, Combe, Vimont, etc., numbered over ten thousand specimens of brains, skulls, and casts of heads of men distinguished in their day for special talents and

characteristics, nevertheless these observers were charged with arriving too hastily at conclusions. Yet here we have Flechsig exhibiting a glaring example of that hasty generalisation and lack of philosophic caution which is commonly attributed to Gall and his school.

What is Flechsig's observation, but that of a "bump" in the skull? This "bump" is moreover on a centre of ossification. And was it not said that the shape of the skull depended more on the strength of the muscles attached to it by reason of the traction and pressure they exercised upon the cranium, than on the development of the brain? Was it not contended that the inequalities of the skull bar us from judging of the development of the brain? Yet if these statements be correct they must hold equally good in this case. Is this the "new phrenology" which Flechsig would substitute for the old? Surely he and his eminent British colleague are acquainted with the numerous cases of *Amusia*—loss of musical ability—which Kast, Oppenheim, Hochwart, and others have collected, in which the lesion was at the anterior extremity of the superior temporal convolution? Still I am grateful to Flechsig for drawing attention to the fact of the large parietal eminences of Beethoven, as his case supports capitally my theory. Bach's skull, of which a photograph is in my possession, shows a normal development of the parietal bone, and no such protruding eminence as His claims for it.

Bach was a mentally normal man, hence one cannot attribute the development mentioned to melancholia, but it can be cited in support of his character, which was that of a prudent, circumspect man, who bore with any amount of injury and insult rather than give up his position, which might have plunged him into

poverty. He acted through the emotion of fear modified by his highly developed intellect. (See Spitta's *Biography.*)

Much easier is the proof in BEETHOVEN's case. Here we have, not the normal but the pathological state. As a youth already he was often morose and given to preferring solitude, being distrustful of others. As he grew older this became more emphasised, and one could quote no better testimony in support of the theory that the largely developed parietal area bears some connection with the melancholic state, than Beethoven's own words, as conveyed in his last will. He there says, "For me there cannot be any recreation in the company of men. I must live like an exile. If I get near company a burning anxiety overtakes me. Moral power alone has uplifted me in my misery. To it do I owe, in addition to my art, the fact that I have not ended my life by committing suicide." (See Schindler's *Biography.*) What better testimony can we have than these words of that great genius?

II. Conclusions

I. All the evidence produced in this paper points to one conclusion, *i. e.*, that a certain relation exists between the central area of the parietal lobe, namely the angular and supramarginal gyri, and melancholic states of mind.

(1) This is shown by over fifty cases of injury to the parietal tuberosity or its neighbourhood, which were severe enough to affect the brain or its membranes; and from the fact that one half of these cases recovered under surgical operation.

(2) This is shown by the mental symptoms accompanying tumours growing in and limited to this area.

(3) Furthermore by the effects of inflammatory disease limited to this region.

(4) This is shown by the idiopathic hæmorrhage sometimes occurring under the parietal protuberance (subsequently forming false membranes or cysts) after sudden fright, severe mental shock, or other depressing emotional disturbance, or in mental diseases ushered in by an attack of melancholia.

(5) It is demonstrated that the symmetrical atrophy frequently observed to take place in the parietal protuberances, is due to a trophic change accompanying a melancholic state of the patient.

(6) Cranial disease affecting this brain-area and congenital abnormal development thereof may also originate melancholia.

II. It is argued that simple melancholia has as its basis a morbid condition of the emotion of fear. This emotion, though all-pervading, must take its start in a limited portion of the brain, which area, when fear is manifested morbidly, as in the different degrees of melancholia, must betoken some lesion. Experimental and anatomical evidence is adduced, showing that:—

(1) The physical expression of fear and its related states can be produced in animals by the excitation of the central parietal area.

(2) That this same area has a close connection with the sympathetic nervous system and the vaso-motor nerves, which are both affected in melancholia.

(3) That in lesions of this area a rise in blood pressure, alterations of sensibility, and disturbances of vision, besides word-blindness and cortical blindness, may accompany the melancholic state.

CHAPTER III

IRASCIBLE INSANITY AND MANIA FURIOSA

WITH 350 CASES OF LOCALISED LESION

1. Introduction.
   The Pathology of Irascible Insanity—Its Diagnosis from Hilarious Mania—Seat of Lesion in the Brain.
2. Injury—General Cases.
3. Injury through Shots.
4. Injury leading to Epilepsy besides Violent Mania.
5. Cases of Injury with Recovery.
6. Tumours giving rise to Violent Mania.
7. Tumours giving rise to Epilepsy besides Violent Mania.
8. Inflammatory Lesions.
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10. Violent Mania Subsequent to Ear-Disease.
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12. Epileptic Insanity.
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CHAPTER III

IRASCIBLE INSANITY AND MANIA FURIOSA

1. Introduction

BY "Mania furiosa" or "irascible insanity" is implied that form of mental derangement which is characterised by ungovernable spontaneous motor impulses and *violent anger*, with or without loss of knowledge of the surroundings, and at the basis whereof lies the emotion of irascibility.

This derangement differs from simple mania. In fact the Germans distinguish the two states by calling the one "Manie," and the other "Tobsucht." Simple mania is the exact opposite to simple melancholia, and its symptoms consist of exuberant joy, excessive hilarity, and an overflow of spirits in generous impulses. There may be great mental and motor activity but not with a destructive intent. The three types of insanity: Simple or hilarious mania ("Manie"), violent mania (Tobsucht), and melancholia are morbid forms of three emotional states: cheerfulness, anger, and fear.

Simple or hilarious mania is an affection of the mind, characterised by an acceleration of the intellectual processes of perception, association, and re-production, together with emotional exaltation; hence the patient exhibits a rapid flow of ideas, coupled with an

unmeaning gaiety, and increased motor activity. Where there are hospitals and clinics for observation of the mentally deranged, as in continental cities, it is difficult at times to distinguish forthwith upon arrival of the patient, whether it is a case of normal joy, albeit exuberant, as may be witnessed after some exceptional event, such as winning the grand prize in a lottery, on meeting a friend after long absence, or the effect of attending a great festivity quickened greatly by the contagion of the general high spirits yet not necessarily induced by stimulants, although they do add to the effect; or whether one has to deal with a case of hilarity arising from an insufficient or a non-apparent cause. Thus the author saw a patient who, while in the surgical ward awaiting an operation for a "tic convulsif," broke out into exuberant joy at the expected relief from his long suffering. The other patients were too ill to join in his hilarity, and he had to be removed to the psychiatrical clinic, where he continued for three whole days in this state. It was afterwards ascertained that he had these attacks of excessive hilarity at periodic intervals. Such cases frequently come into conflict with the law when the patients happen to prove very hospitable to their friends and acquaintances whom they may have invited to a public inn, and afterwards will not or cannot pay the cost of the feast.

The perfect health and general well-being of these patients renders them joyous, communicative, sociable, satisfied with themselves and content with others. They have a quick succession of ideas, hence their talk is effusive.

A hilarious maniac will only get angry when offended, or on receiving ill-treatment, and even then only temporarily. There is an essential difference underlying

these two conditions of joy and fury. The latter is evoked by an outside cause and will eventually disappear after the cause is withdrawn; whereas the former condition, that of hilarity, is independent of external causes, and is a symptom of the brain disturbance. No delusion or hallucination is necessary thereto. His motor excitement is of the mild hilarious intoxication type and not of the destructive furious rage order. If damage is done it is good-humouredly. His stream of talk in the early stage is perfectly coherent, only in the advanced stage does it become more or less incoherent; the talk is not always refined owing to the loss of inhibitory power over the propensities, hence the patient may show the erotic passion, or he may steal if there be an inclination to it normally, but even then it is not done from a blind impulse, but from a desire to do mischief for the fun of the thing. This desire to do mischief for his or his companions' amusement may prove troublesome, but it is easily controlled by judicious management, and he is not regarded as dangerous. Hilarious mania is due to a hyperæmia of the frontal lobes of the brain.

Tumours of the frontal lobe, as Oppenheim and Jastrowitz have observed, frequently are accompanied by a manifestation of "hilarity" and "witticism," which are retained sometimes even on the operating-table, until the application of the anæsthetic.

Irascible insanity is a form of mental disturbance in which the prevailing symptom is anger, whether the irascible emotion exhibits itself in violent and groundless rage or in equally groundless albeit less violent anger, arising from peevishness and discontent, or through a contentious and irritable disposition, which is for ever engaging in quarrel and brimming over

with resentment. The patient may be so furious as to exhaust himself in shouts, threats, and actions, or his passion may be less vehement, but in all cases it is "anger," whether it be spread out thin or thick. It is not the harmless restlessness of the hilarious maniac, nor the restlessness of the anxious melancholiac, but an ungovernable intense excitement when fully established, a wild paroxysm with a blind desire of destruction.

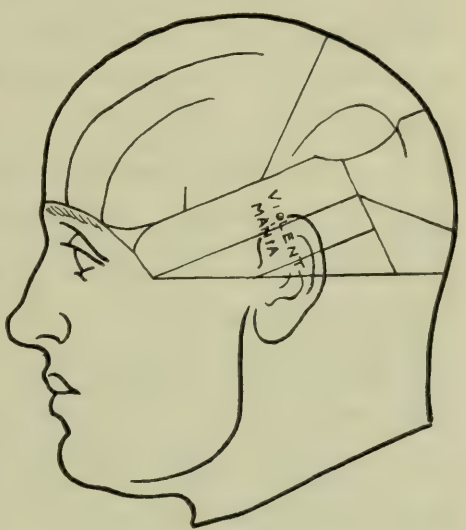
The expression of the face is one of rage, the eyebrows corrugated, the eyeballs staring and protruding, and the face flushed. The whole body is in a state of intense excitement, and the patient gesticulates wildly in a threatening and aggressive manner. He tears his clothes to tatters and smashes in pieces whatever comes in his way. Whoever touches the patient is abused or struck by him. The case is marked by excessive destructive violence and utter disregard of personal danger. His anger and violence manifest themselves in their greatest intensity by shrieking, roaring, raging, and abusive utterances.

A man in a state of furious mania may commit a murder. There is no motive for the act; previous character without reproach; absence of hallucination; the explosion of mania manifesting itself in one act of violence or crime, and the immediate return of reason after the act is accomplished; he may be perfectly calm after the act of violence; he experiences no regret after the criminal act. No consciousness during the act, nor recollection afterwards. No preparation beforehand, but snatching whatever comes to hand or happens to be within easy reach at that time and place. An ordinary sane criminal, having a definite purpose, accomplishes that and is then satisfied; but the homicidal maniac

has only one purpose, to destroy; he is not satisfied with merely killing; he goes beyond. Though the victim whose throat is cut may be dead already, the maniac will give him another stab in the heart or a blow on the head, or sever the head and fling it out of the window.

Gall's description of the brains of homicides has greatly aided me in this particular investigation.

Several hundred cases will be cited which will demonstrate that there is a relation between lesions of the brain in the *middle portion of the cortex of the temporal lobe* and the manifestation of irascibility and of destructive mania, as shown in various forms of insanity, viz.: mania furiosa, homicidal mania, epileptic mania, and post-hemiplegic insanity. The lesion may be due to injury, to the growth of a tumour, to inflammation or softening, and to pressure or extension of lesion from neighbouring parts.



Starting with lesions due to injury, a number of general cases, with or without fracture to the temporal bone, will be given, besides injuries resulting from shots, from a box on the ear, and other cases of special interest.

2. Injury to the Temporal Area. General Cases

Professor v. Krafft-Ebing.—*Medico-legal case.*—J. L., healthy up to his twenty-first year, a quiet, peace-

ful man; family history good; was attacked one day and struck on the left side of the head above the ear, causing hæmorrhage from the ear. He was unconscious for nine days and subsequently deaf in the left ear. Since that time he became avaricious, greedy for money, irascible to an ever increasing degree so that he could bear no contradiction and at once took to personal violence. Four years after the accident he married, but he only ill-treated his wife and children for no or very trifling cause, and beat them until they bled and were half dead. Punishment had no effect on him. One day a neighbour teased him and challenged him to shoot if he dared. L. did so and killed him. He immediately gave himself up with the pistol still in his hand. His state of mind was being inquired into. He was transferred to an asylum. His irascibility and violence continued there, also his covetousness. He threatened to shoot all the doctors. He suffered from headache, giddiness, and tinnitus aurium, but there were neither motor disturbance nor hallucinations.—(*Über die durch Gehirnerschütterung und Kopfverletzung hervorgerufenen psychischen Krankheiten.* Erlangen, 1868, Case 25.)

The same Author.—G. G., 58 years of age, a farmer, up to then healthy and not tainted, was run over twenty-five years ago by a cart laden with stones in such wise that the wheels passed over his head, producing a dent in the bones over the left ear, three inches long, one inch broad, and one half inch deep, stretching from the frontal bone across the temporal to the inferior part of the parietal bone. Patient was unconscious for a long time, recovered, however, completely, there remaining only some deafness in the left ear with an occasional paroxysm of rage. These affections did not, however, interfere with his vocation for twenty-three years. Two years prior to admission subsequent to some financial losses, his excitability increased, and he had an attack of acute mania lasting several weeks, and repeating itself again and again after lucid intervals of eight weeks. In these intervals he was mentally torpid and had to keep a good deal in bed suffering from headache. After

admission to the asylum the paroxysms of acute mania continued with shorter intervals, varying from three weeks to ten days, and lasting, as a rule, from six to ten days. Besides the mania he showed a morbid impulse for hoarding. The ebullitions of rage, his great destructive propensity, and his active kleptomania necessitated his isolation. In the intervals he showed signs of exhaustion. He died of bronchitis after ten years' residence.

The autopsy revealed a deep scar on the left temporal bone half an inch deep, pieces of bone having pressed on the brain substance and caused softening there.—(*Ibidem*, Case 16.)

The same Author.—J. S., 25 years of age, innkeeper, no hereditary predisposition, previously healthy and of peaceful character, married to an evil-tempered woman, who one day threw a porcelain jug at him, which struck him on the left temple. Two deep wounds in front and above the ear were the result, one having cut the temporal artery across. The wounds healed normally but already after three weeks there was pain radiating from the scars and evoking great irascibility. The patient became violent, attacked those who approached him, complained of sleeplessness, buzzing in the left ear, from which pus oozed from the third day after the injury. His violence and destructiveness increased, necessitating his admission. There was œdema around the scar, and at the posterior part one could feel a distinct depression of the bone with projecting edges. The part on pressure proved very painful. Tormenting tinnitus aurium. On the ear trouble being attended to, the excitability of the patient diminished, and he was able to be discharged four months after admission. On later inquiry it was found that he still suffered from pain over the area of the depressed bone, was still easily roused to anger and rage, and when in that state he would get into a mental confusion which passed quickly away.—(*Ibidem*, Case 12.)

The same Author.—A. W., 28 years of age, fell when twenty years old from a height on to his head, from which injury a still visible scar and fissure on the left temporal bone resulted. He showed mental confusion at first, then broke out into violent mania with extreme irascibility, afterwards became demented.—(*Ibidem*, Case 24.)

Gustav Spies.—Margarete L., 36 years of age, married, mother of three children, was most irascible. Her husband noticed in her an abnormally excitable libido sexualis. Otherwise she was well, an affectionate mother and an industrious housewife. After knocking her head one night in the darkness against a stone, her husband was alarmed at her irascibility, which seemed to increase every day after the slight accident. She became furious, raging, aggressive, and voracious. A slight contradiction would result in personal violence. In the intervals, she was good humoured and loquacious, but very excitable as regards libido sexualis. A week after the accident she became so violent that she had to be brought to the asylum ; even extreme force had to be used. Her destructive, aggressive, and noisy mania soon necessitated the application of the straight jacket. Her muscular power during these attacks was something astounding. In another week she had sitophobia,

and great difficulty was experienced in feeding her by reason of her violent resistance. The lucid intervals grew briefer with each attack. After one of these outbreaks of fury she collapsed and died.

The post-mortem examination revealed hæmorrhage in both middle fossæ, more so in the right, adhesion of the dura to the base of the skull, and sclerosis of both Cornua Ammonis. There was also hyperæmia of the grey substance of the cerebellum.—(*Zur Casuistik der traumatischen Manie*, Würzburg, 1869.)

Dr. Zierl.—L., 34 years of age, was wounded in the left temple in the war of 1870. The wound only healed after the lapse of a year. Since that time the patient, who was previously mentally sound and upright, had a delusion that everything he saw belonged to him. He suffered from headache and giddiness. There was a depression in the bone, to which the superficial tissues were adherent, which became tender upon pressure and changes of weather.

L. was accused of having appropriated the proceeds of the sale of goods belonging to his firm, but his principal admitted that he considered him not quite sound mentally, and that he had returned the value of the goods. L. had been sentenced eleven times before for similar offences. He was sent to the asylum for observation, where paroxysms of irascibility were noticed, resembling epileptic mania, though there was no record of convulsions. His skin became pale and his glance staring, and on any one disturbing him in the slightest degree, he became violent and destructive, and after the attack remembered nothing about his acts. The outbreaks started with pain in the scar and were accompanied by sweating or shivering and trembling, and by delusion that everything he saw belonged to him. Acting on this delusion, he had retained other folks' property, and hence the numerous committals for embezzlement.

He was declared not guilty, as suffering from epileptic mania.—(*Friedreich's Blätter für gerichtliche Medizin*, 1882, Case 2.)

Wm. Julius Mickle.—J. W. T., aged 47, married, a timekeeper, admitted to Grove Hall Asylum. It appeared that the patient had sustained a very severe blow on the head from a stone nearly two years previous to his admission. He was never quite himself afterwards. Previously to the injury he had always enjoyed good health. The place struck was in front and slightly above the left ear. The doctor said the pad of muscle there saved his life; as it was, the injury caused a slight concussion, and he was confined to his bed for three weeks. During the last three or four months he became subject to delusions of all kinds, more particularly about money. Another symptom was that he had such an increase of appetite. Previous to that he had always been a small eater; eating scarcely sufficient to keep up his strength.

The certificate said that he was dangerous to others, that he acted strangely—as, for example, secreting trifling objects about the house and filling his pockets with coal; that he had the delusion that money had been left at his house for him; that he had been violent and unmanageable; had broken windows, had threatened to kill, and had a knife beneath his pillow. There was failure of memory.

Necropsy.—Besides the orbital convolutions, gyrus hyppocampi and uncus, the superior middle and inferior temporo-sphenoidal convolutions showed adhesion and decortication.—(*Journal of Mental Science*, October, 1885.)

Reginald Harrison.—A dock labourer, aged 43, had fallen head foremost down a ship's hold, a distance of about 30 feet. On admission was insensible, cold, and almost pulseless. In the course of the afternoon he partially recovered sensibility, but on being aroused he became exceedingly riotous. On the day following his admission he was in a semi-conscious state. On speaking to him he endeavoured so answer but became exceedingly noisy and riotous. On the third day his condition remained much the same. He became so excited and violent during the night that at times he required two attendants to restrain him. There was no fever. On the fifth day he gradually became completely insensible, and died on the tenth day.

Post-mortem. — The pia mater was unusually congested at the base, and the temporal lobes at the base were of a dark olive colour, gradually fading into the normal appearance as traced upwards; they were also much softer than natural, in some parts almost diffluent. The two anterior lobes had some small extravasations and the two posterior lobes as well as the rest of the brain were quite free.—(*British Medical Journal*, 27th November, 1869, Case 4.)

Charles L. Dana.—Kate C., aged 32, domestic. Always healthy. No epileptic history. Two years prior to admission patient fell down an air-shaft, distance of 35 feet, striking her head. She was unconscious for several days ; was in bed for several weeks. Her friends said she grew different in disposition afterwards, and became "queer" in her mind. At times she was very destructive. Eighteen months later supervened chill, three days fever, temporary rigidity of left arm, continuous headaches with vomiting. Four months later vertigo, forced movements, sudden falling, always backward and to the right. When the headache was less severe and she grew more conscious, she proved very restless and would throw herself out of bed continually, always on the right side of the bed. At last she was tied in.

Autopsy.—On removal of the brain a good deal of blood was seen in the right middle fossa. On the under surface of the right temporal lobe was a focal lesion consisting of softened brain tissue mixed with blood. The lesion involved the third and fourth temporal convolutions in their middle three fourths.—(*Journal of Nervous and Mental Disease*, 1889, vol. xvi.)

Bonville Bradley Fox.—K., aged 49, formerly a cool, collected, precise, sober and particularly neat fellow, who had always enjoyed very good bodily health. Perfect mental health up to the time of the accident, when he was thrown out of a trap on to his head. There was a scar on the left side of the head from near the sagittal suture to the temporal region. No worry, no overwork, no anxiety, no alcohol, or syphilis. A day after the accident he became irritable, contradictory, arbitrary, and threatened to assault his wife. When he ate he did so ravenously. Exaltation appeared in a day or two. On admission 16 days after the accident, he had symptoms of general paralysis. He was the personification of restlessness, had an outbreak of frantic, unreason-

ing violence, grew increasingly dirty, and was transferred to another asylum.—(*Journal of Mental Science*, July, 1891, vol. xxxvii. Case 2.)

F. Lallemand.—Joseph Prevot, 40 years of age, of an athletic build, received a severe blow on the left temple, which was followed by pain mainly at the point of injury but also on right temple. He became violently maniacal, extremely noisy and destructive. His face was red, conjunctivæ injected. The maniacal delirium continued for two days, after which he slept soundly. On awaking he had an immense appetite and drank with avidity. He had recovered his healthy appearance and mental state. Five days afterwards sudden fever, vomiting, difficulty of respiration, and coma.

Post-mortem.—Fracture and caries of the petrous bone, encysted hæmorrhagical focus in the left temporal lobe, lateral ventricles dilated to double their size.—(*Recherches anatomico-pathologiques sur l'Encéphale*, Paris, 1830.)

Paul Schüller.—W. Sch., 30 years old, three days after receiving in a fight a wound in the temporal region, had furious mania with destructive impulses.—(*Psychosen nach Kopfverletzungen*, Leipsic, 1882, Case 1.)

By the same Author.—G. Sp., a young farmer, 19 years old, was hit by a falling tree in the right temporal region, which caused temporary deafness in right ear. Three months afterwards he became irascible, furious, and destructive. He destroyed the stable, violently attacked his father, who had to be rescued by neighbours. No evidence of hallucinations.—(*Ibidem*, Case 27.)

Paul Guder.—Case 7 was admitted for furious mania, dating from an injury whereof two long scars on the temporal bone over the ear were still visible. He easily got into a rage. His attacks lasted about 35 minutes. He gnashed his teeth. He was trephined and appeared to get well. He was discharged four months after the operation. The same day he was arrested for the committal of a theft.—(*Die Geistesstörungen nach Kopfverletzungen*, Jena, 1886, p. 100.)

Bernhard Becker described several cases of fracture of the base of the skull followed by "mania furiosa." The following is an example: A soldier slipped on the ice and injured the left temporal region of his head, which became swollen. Soon the patient, though apparently unconscious, became restless and violent; four people could hardly hold him. Acute maniacal fury broke out so that he now required six people to prevent him from striking and biting. On examination, both temporal and petrous bones were found fractured. On trepanning pus escaped. Patient died after two days, when softening of the brain matter at the seat of injury was noticed.—(*Die Schädelverletzungen*, Freiburg i. B., 1865.)

Landerer and Lutz.—A soldier, 45 years of age, received in the Franco-Prussian war a sword-thrust in the left temporal region. He suffered first from irascibility, and later on from furious mania.

Post mortem.—An old hæmatoma was found over the dura mater at the seat of the injury.—*Report* of the Private Asylum, Christophsbad, in Göppingen, 1878.)

The same Authors.—K., patient 40 years old, fell from a cart; un-

conscious for several days, pus escaped from the left ear, great irritability and violence, hence confinement in the asylum. There, symptoms supervened of furious mania with paroxysms of violence.

The post-mortem examination revealed fracture of the middle fossa and hæmatoma of the dura at base of the brain.—(*Ibidem*, Case 8.)

Ludwig Schlager.—Case No. 1, hæmorrhage from both ears, through a fall on the head, five weeks afterwards otorrhœa, deafness, aphasia, giddiness, and maniacal fury.—(*Zeitschrift der Gesellschaft der Aerzte zu Wien*, 1857, vols. vii. and viii.)

Dr. Flemming.—Patient, a woman, no evidence of hereditary taint, met with an accident through a tree falling and hitting the side of her head. There resulted a dull pain, she became irascible, and often without cause got into an extraordinary rage. In one of these attacks she attempted to kill her daughter. Admitted to the institution, she showed maniacal fury.

The autopsy revealed old hæmorrhage beneath the arachnoid membrane at the base of the brain, in and around lateral ventricles, with softening of the neighbouring brain substance.—(*Bericht über die Heilanstalt Sachsenberg*, 1840-1849.)

Dr. Hartmann.—Engel, kicked by a horse on temporal bone, ill for three months, irascible and aggressive for years afterwards.—(*Archiv für Psychiatrie*, 1884, vol. xv., Case 13.)

Professor Billroth.—Patient received a kick from a horse on the head. The injury took place four years before his death. He was able to return home after three weeks' treatment; the only symptom noticed by his friends was a mental change; great irascibility.

Post-mortem.—A softening of the cortex at about size of a crown piece was found on under surface of right temporal lobe.—(*Chirurgische Klinik*, 1871, p. 74.)

H. Voppel.—Patient, 37 years of age, manifested paroxysms of fury with violence, and was dangerous to others; showed a scar adherent to left temporal bone, with groove-like depression in the bone.—(*Allg. Zeitschrift für Psychiatrie*, vol. xiv., 1857.)

Julius Wagner.—C. P. fell on the left temporal region, from the first floor. Pain radiating from this region, and paroxysms of fury since. No remembrance of his acts.—(*Wiener Jahrbücher für Psychiatrie*, 1889, vol. viii.)

Dr. Savory.—S. L., aged 35, a carman by occupation, was brought to the hospital, a bale of cotton goods weighing 3 cwt. having fallen from a cart on to his head. He was unconscious and had a discharge of serous fluid from the right ear. He was very violent, and had to be strapped down for nearly a fortnight. He had paralysis of the right facial nerve. For two months patient progressed favourably and was clear in his intellect. Then he grew worse, and died with symptoms of abscess in the brain.

Post-mortem examination revealed fracture of the right temporal bone with two abscesses in the temporal lobe.—(*British Medical Journal*, 15th May, 1869.)

James R. Whitwell.—E. L., male, aged 34, had a pale yellow bruise

over the right temple, about 1¼ inches broad. No antecedent history given. Mentally, patient was continuously noisy and restless, shouting, mischievous, though not violent. He upset everything that was within his reach without being disturbed by the crash. This condition of mania was steadily persistent until his death, *i. e.*, for four and a half months. He died suddenly one morning after his usual nightly outburst. —(*Journal of Mental Science*, July, 1891, vol. xxxvii.)

Charles Phelps.—A clinico-pathological study of injuries of the head. Dr. Phelps gives 42 cases of injury of the temporal bone of the skull (fractures of the middle fossa) with laceration of the subjacent brain, accompanied by mental symptoms of restlessness, irritability, excitability, noisiness, abusiveness, and delirium, some of them requiring restraint. See cases 1, 4, 5, 6, 9, 10, 18, 19, 20, 21, 23, 24, 25, 28, 34, 50, 51, 55, 56, 59, 60, 63, 68, 71, 79, 93, 107, 115, 117, 118, 126, 147, 217, 241, 246, 250, 252, 255, 257, 261, 272, and 282.—(*New York Medical Journal*, 1893, vol. lvii.)

O. Herpin has described several cases of fracture of the temporal bone, accompanied by acute mental symptoms, irascibility, violent agitation, requiring restraint.—(*Bulletins de la Société anatomique*, 1876, and *Progrès médical*, 1876.)

James Ross gives a case of a patient with fracture of the cranium about the ear, who was so filthy in his expressions that he had to be isolated. He recovered after six weeks.—(*Diseases of Nervous System*, London, 1883, vol. ii., p. 499.)

W. H. Battle gives two cases of fracture of middle fossa of skull, with restlessness, irritability, inclination to fight, and delerium.—(*British Medical Journal*, 12th July, 1890.)

A similar case by Estlander.—Boy 13, violent behaviour after sustaining fracture of the middle fossa. Immediate surgical operation. Recovery on thirty-eighth day.—(*Finisk Läk Handlingar.*)

Other cases of blows or falls on the temporal bone, and laceration of the temporal lobe of the brain, with restlessness, irascibility, aggressiveness, obscenity, etc., are : **G. J. Guthrie,** *On Injuries to the Head affecting the Brain*, London, 1842. **Charles L. Dana,** *Journal of Nervous and Mental Diseases*, New York, 1889, vol. xvi., Case 2. **Alcock,** "Laceration of Brain without Paralysis," *Lancet*, 10th March, 1877. **Hartmann,** "On Mental Disturbances after Injuries to the Head," *Archiv für Psychiatrie*, 1884, vol. xiii., Case 29. **Shaw and Cripps,** *British Medical Journal*, 14th June, 1890. **G. Thomson,** *Brain*, 1884, vol. vii., p. 510. **L. F. Arnaud,** *L'Encéphale*, 1888, vol. viii., p. 724.

M. Jowett.—*Injury to Temporal Lobe. Loss of Speech but able to swear.*—A Frenchman, 27 years of age, while blasting coal, was struck by the blasting barrel (a ⅝ inch gas pipe, 4 feet long) near the external angle of the superciliary ridge of the right side. The barrel passed through the bone, fracturing the orbital plate, and emerged at a point about an inch and a half above and behind the left ear. The rod was extracted with difficulty. For several days he was comatose. About the twelfth day he showed signs of consciousness, improved after the

third week, and in eight weeks from the time of receiving the injury, he was able to leave his bed. Physically he remained well, but his mental power was impaired, and he was aphasic, except that he could swear in French.—(*Western Journal of Medicine*, March, 1868.)

R. Bruggia.—*A Similar Case.*—A case described in great detail of a fireman, 35 years of age, who in consequence of an explosion was hit by the point of a wooden rod in the left temporal region, about 2 to 3 cm. above the external opening of the ear, so fiercely that it indented the bone to the extent of admitting the point of a finger. Fourteen days' stupor followed this accident, after which he was unable to speak, though he understood everything that was said to him, and easily got into a temper, in which he could use abusive words quite fluently, which he could not articulate when quiet again. He could reproduce melodies without a mistake.—(*Arch. ital. par le malat. nervos*, 1884, vol. xxi.)

After a box on the ear, a very irascible disposition, frightful rage, and ungovernable fury is frequently manifested. This is not merely due to the insult, but to the concussion of the temporal lobe.

B. Ball.—The patient, 22 years of age, **received a blow on left ear** when 13 years of age, which was followed by perforation of the tympanic membrane with putrid discharge; also noises in the ear. He sought treatment on account of his uncontrollable paroxysms of anger. Later he also heard voices of an insulting character. The otitis media was treated, and with its gradual disappearance the mental symptoms improved.—(*L'Encéphale*, 1881.)

Paul Schüller.—N. R., a servant, 28 years of age, **received a severe box on the ear,** became irascible afterwards, furious and raging, and quarrelled all day with the offensive voices which she heard.—(*Psychosen nach Kopfverletzungen*, Leipsic, 1882, Case 25.)

Krafft-Ebing.—Violent mania of a student after being **boxed on the ear** by his master.—(*Friedreich's Blätter*, 1868.)

Another case (No. 30) by **Dr. Hartmann.**—(*Archiv für Psychiatrie*, 1884, vol. xv., p. 98.

3. Injury from Shots

Dr. Wendt.—*On Insanity after a Shot in the Left Temple. Recovery.*—A soldier, 25 years of age, received a shot in the left temple at the battle of Hallue. Five days afterwards two pieces of lead were removed from the wound, which extended from the left eyebrow horizontally to the posterior part of the temporal bone. After the wound had healed the scar was painful, very tender on pressure and on movement of the law muscles. He left the army, returned to his trade, and kept well for

a time, with the exception of these pains. After a year and a half there were hallucinations of hearing, and a few months later he became violently maniacal, the attack setting in with a piercing pain in the left temple. After admission he had these atacks every fortnight, and they lasted from five to eight days. Patient, who when well was a quiet, modest man, became, when he had an attack, red in the face, noisy, quarrelsome, fighting, abusive, and violent. He was treated with morphium injections, and got well in six months, when he received his discharge. Another six months later he reported himself well and free from attacks.—(*Allg. Zeitschrift für Psychiatrie*, Berlin, 1875, vol. xxxi.)

Hermann Demme.—Elia Cheina, an Austrian soldier, was struck at the battle of Solferino by a ball in the temporal region, which crushed the tissues and bone. Deafness and paralysis of left facial nerve followed. Noisy, maniacal excitability until his death, three weeks after the accident.

Post-mortem.—There was pus in the middle fossa covering all the tissues; both ventricles dilated; the petrous bone showed a wide open crack.—(*Militär-chirurgische Studien*, Würzburg, 1864, p. 70.)

Demme gives two other cases (*Ibidem*, pp. 56 and 57) of injury to the temporal bone of Austrian soldiers in battle, and followed by violent delirium.

(**Recueils des traveaux** *de la Société royale de médecine de Bordeaux*, January, 1838.)—A soldier received a shot in the temporal area, the ball passing through the brain and remaining fixed in the lambdoidal suture. Patient was subject to paroxysms of fury until he died, seven years after receiving the injury.

Dr. Azam.—*Mental Change Consequent on Brain Injury. Recovery.*—X., 38 years old, was shot in 1870, the ball penetrating his skull at the upper end of the fissure of Rolando, and coming out about nine cm. above the external auditory meatus. The injury was followed by hemiplegia on the right side and aphasia, lasting only two or three days. A peaceful, agreeable man previously to the injury, he had changed to a very sensitive, irritable fellow who got bad tempered even without any provocation. He was trepanned and the ball extracted. After the operation the patient regained his old character.—(*Archives générales de Médecine*, 1881, vol. i. Case 2.)

J. Christian.—V., 40 years of age, a retired officer. In the Mexican war he was shot by a ball which entered his skull through the left eye and escaped through the temporal bone. In consequence of this injury his intelligence gradually became enfeebled, and he developed, besides a tendency to steal, an excessive irritability of temper, so that he had to be placed in an asylum.—(*Archives de Neurologie*, Paris, July, 1889, vol. xviii. Case 10.)

Thomas Smith.—*Recovery.*—A person of education and some acquirements, aged 35, was brought into St. Bartholomew's Hospital within half an hour of having made an attempt on his own life with a revolver. There was a wound in the fore part of the right temple, from which blood was flowing freely, and there was great and rapidly in-

creasing swelling beneath the scalp, which extended all over the frontal and orbital regions to the opposite side of the head, where there was a large effusion of blood beneath the scalp; and here, in the left temple, a hard body could be felt, which was assumed to be the bullet: the soft parts about the fore part of the head were emphysematous. The patient was quite conscious, and answered questions correctly concerning his name, age, address, etc., of his own accord. He spoke in German, but when addressed in either French or English he would reply in the respective language. He showed no sign of mental incapacity, nor was there any loss of motor power. A probe could be passed its whole length into the wound and across the head without meeting with the slightest resistance. On being asked if he felt it, the patient replied "in the ear." He passed a very restless night, and could with difficulty be kept in bed, but being unable to see, he imagined himself in an hotel, and ordered various delicacies of the "waiter." He consented, however, without remark to take the more modest fare supplied him. He slept at intervals, but was at other times restless and troublesome.

On the following days he wandered in the night, was violent with his nurse, striking her with his fists; told a friend that his wound had been received in the Franco-Prussian war (in which he served); on other subjects he was quite rational, though he was irritable and morose; wrote a letter which gave evidence of some delusions with regard to his pecuniary resources. Was very unruly and irritable; could not be kept in bed, and was therefore allowed to dress himself and get up. From the 17th day he made rapid progress, his intelligence being perfect, though he was very morose at times. The pulsation and movements of respiration in the swelling on the left temple were very distinct. On the 23rd day he casually mentioned that he was in possession of a million of money, but showed no other sign of mental disturbance. By the 31st day the wound in the right temple had closed, and the pulsation and swelling on the left side had much diminished. On the 43rd day his natural temper had been regained, and his manners were courteous, and his bearing that of an educated gentleman. Soon after this time he left for the Highgate Convalescent Hospital. Early in his convalescence the loss of smell was very considerable.

There can be no doubt that there was a temporary, but very marked alteration in the patient's temper and disposition, as the result of the injury. For a time, extending over three or four weeks, he was most overbearing and occasionally violent in his conduct and his behaviour to his nurse. At times he was lethargic, at times restless and irritable; but as he recovered strength he regained the disposition which his friends said was natural to him.—(*Lancet*, 3rd May, 1879.)

R. W. Amidon.—Patient received a pistol shot wound in the head. The ball entered the right temple, injuring the tip of the temporo-sphenoidal lobe and pursuing a transverse direction across the base of the frontal convolutions. Restlessness and swearing were the mental symptoms.—(*Journal of Nervous and Mental Diseases*, 1880, vol. vii. Case 6.)

A similar case is quoted by **Daniel Clark**, *American Journal of Insanity*, 1881, vol. xxxii.

4. Injury to Temporal Lobe leading to Violent Mania and Epilepsy

Francis Skae.—J. E., aged 15, son of a farmer. His father's statement was as follows: He was a very intelligent boy until he was five years of age, and at that time he was struck immediately behind the ear by his schoolmaster with a ruler. The blow caused swelling and ecchymosis,—no fracture. The same night he screamed out in his sleep; in the morning a change in his manner and appearance was noticed; he seemed stupid and silent; he ceased to speak entirely for six weeks. When he began to speak again he talked nonsense. It is now ten years since he received the blow; he is often very noisy at nights, and he swears a great deal. His father managed him at home until he brought him to the asylum on account of his violence and his dirty habits. He never had any fits or any symptoms of paralysis. On admission he seemed perfectly imbecile, and his bodily condition was weak. He was very noisy at night, swearing profusely, and he was very dirty in his habits. He was put among the noisy patients, and continued in that ward. For a year and three months after his admission he continued unchanged. Then followed a succession of very severe epileptic fits for three days, in one of which he died.

The post-mortem examination revealed nothing but four drachms of serum in the lateral ventricles.—(*Edinburgh Medical Journal*, 1866, vol. xi. Case 2.)

Dr. Schäfer.—E. M., 45 years of age, fainted in the street and was run over by a carriage, whereby his head was injured. Since then he showed irritability. One night he got extremely excited, striking about so much that he had to be brought to the asylum. Two months afterwards he had epileptiform convulsions, with severe deliria. He died seven months after admission.

Post-mortem.—A focal lesion was found in the grey matter of the third temporal convolution.(—*Centralblatt für Nervenheilkunde*, 1st February, 1881.)

William Julius Mickle.—J. H., soldier, aged 22, had a severe fracture of the skull by a fall from horse-back before entering the army in 1871. Since 1873 he was subject to nocturnal epileptiform seizures, followed by violence. Dementia appeared and increased. Noisy at night and drowsy during the day. A cicatrix showed at the left temporal region, with marked irregularity of bone.

The necropsy revealed a fracture across the temporal bone and wasting of grey matter, facing the line of cranial fracture and involving a large part of the frontal lobe besides the inferior surface of left temporo-sphenoidal lobe.—(*Journal of Mental Science*, April, 1881, vol. xxvii.)

James Lane.—J. S., aged 27, painter, fell head foremost from a scaffolding 25 feet high. On admission he was collapsed and insensible,

there was extensive bruising of the right temporal region and ear, and bleeding from the meatus. After about two hours he vomited, and recovered his senses. Soon afterwards, however, he become noisy, restless, and at last violently delirious, so that he had to be strapped in bed. Three days later he was still violently delirious. On the fourth day three severe epileptiform fits occurred; the fits continued, but his restlessness diminished. On the sixteenth day it was found that, though sensible and wishing to speak, he could not express himself intelligibly. A month later he could speak, except when excited.—(*British Medical Journal*, 27th July, 1872.)

James Russell.—Fanny G., a dressmaker, received a blow on the side of the head when five or six years of age, but no symptoms presented themselves, except a forgetfulness for verbal commissions, and her temper became irritable. Five or six years after the accident epileptic fits developed. On the right side of her head, an inch and a half from the sagittal suture, and exactly in a line with the auditory orifice, a cicatrix existed in the scalp. She was trephined at the spot, but died.

Post-mortem.—There was a quantity of pus, extending from the opening of the skull towards the base as far as the petrous bone.—(*Ibidem*, 17th June, 1865.)

Lawson and Major.—B. W., when six years old, was knocked down and run over by a carriage wheel, injuring the whole of the right temple, and leaving a depression. Some portion of the bone had necrosed and came away. From that time he had fits. Previous to the accident he was a bright, intelligent boy; he now became more and more demented. He was given to paroxysms of noisy excitement, in which he fought fiercely and attacked his companions. He was admitted in 1873. During the year 1874 he continued to be aggressive and quarrelsome. During the whole of this period he had an offensive discharge from the left ear, and in September, 1875, a small abscess formed behind that ear. In the winter of 1876 he had several severe hæmorrhages from mouth, nose, and left ear, up to a quart of pure blood at a time. He continued querulous and stupid. On April 20th of the same year, after a frightful outburst of bleeding, he died.

Post-mortem.—There was an old clot in the right temporal lobe, and both grey and white brain substance were degenerated. There were depressions and rough projections on the petrous portions of both temporal bones and brown staining of both bone and dura mater. The hæmorrhage was caused by friction of the larger vessels against the corroded osseous prominences.—(*Lancet*, 8th July, 1876.)

Max Huppert.—*A Slate-pencil in the Head.*—Carl T., 42 years of age, well educated, industrious, and always of a cheerful temperament, received an injury to his head about a year ago and was since irascible. He ill-treated his wife, and when admitted to the institution his fury continued. Hæmatomata auris appeared spontaneously in both ears. A year after he had epileptic fits. He died of œdema of the lungs a month after the first fit.

On post-mortem examination there was found stretching from the inner wall of the squamous portion of the right temporal bone, along the middle fossa to the cornu ammonis, a slate-pencil, 73 mm. × 5 mm. (nearly three inches long and one fifth of an

inch broad). No history could be ascertained how the pencil got there. The appearance was much as if the pencil had been in this situation all the patient's life and had caused no symptoms until the accident, a year before the patient's death.—(*Archiv der Heilkunde*, Leipsic, 1875, vol. xvi.)

Julien Tellier.—Clement J., 37 years of age, received, two and a half years prior to admission, a violent blow on the right temporal region, and was since then subject to paroxysms of irascibility and violence, and to epileptiform attacks.—(*Des suites éloignées des Traumatismes du Crâne*, Lyon, 1890, Case 46.)

Ludwig Schlager.—(1) Fall on the head, bleeding from both ears, five weeks later otorrhœa and deafness. Mental change : acute mania.

The same.—(2) Fall on the head, acute mania with epilepsy.

Post-mortem.—Softening of both temporo-sphenoid lobes.—(*Zeitschrift der Gesellschaft der Aerzte zu Wien*, 1857, vols. vii. and viii.)

Arnold Pick described a case of traumatic epilepsy with mania furibunda. Patient's injury caused a scar between coronal suture and temporal muscle on the left side. The convulsions were preceded by paroxysms of anger.—(*Prager medizinische Wochenschrift*, 1880.)

Van Deventer.—Patient, a quarrier, 30 years old, was wounded on the left temple by the fall of a marble plate. He was knocked over, but went on with his work. During the night he had hallucinations and attacks of acute mania, and paresis of right side. Seven months after epileptic convulsions. The paresis disappeared after thirteen months. The violent agitation continued, however, and patient became demented.—(*Psychiatr. Bladen*, 1887, vol. v.)

5. Cases of Injury, recovering after Operation

Francis Skae.—Patient, Mr. D., 24 years of age, an officer in the army, a young man of strictly temperate habits. Seven years ago, while in India, he was thrown from a carriage-palanquin, and fell with violence on to the left side of his head, apparently with no immediate after-effects, as he remained with his regiment for five and a half years after the accident. On his return home he continued well for a year. He then had his first attack of Ménière's disease (incessant rotatory motion from left to right, described by the author as an epileptic fit) with maniacal paroxysms. From that time he had regular monthly attacks, consisting of a series of fits, followed by great excitement, lasting three or four days. On admission, six months after the attack, he was so violent that two attendants could not restrain him, and he was sent to a padded room to prevent him from injuring himself by the furious manner in which he dashed himself about. For some days after admission he continued in almost incessant rotatory motion, from left to right; this he did whether sitting or lying. His eyes were usually open, fixed in a glassy stare ; his movements were all automatic. Every night at ten o'clock he took some food, but he manifested no consciousness whatever ; he continued for ten days in exactly the same condition, and then slowly and gradually regained consciousness. The regular rotatory

movements ceased ; he complained of pain at the seat of injury. Pressure on the cicatrix gave pain. Trephining on this point gave only temporary relief. The previous attacks recurred, followed as usual by maniacal paroxysms. Thus he remained for four years. For the last three years he had suffered less frequently from these fits, and had no maniacal attacks at all. On one or two occasions when exposed to annoyance or excitement, he showed an uncontrollable impulse to strike or commit some violent act, and this excited condition, during which he was apparently only semi-conscious, lasted but a few minutes. With these exceptions he was perfectly sane.—(*Edinburgh Medical Journal*, December, 1860, vol. xi. Case 3.)

W. B. Fletcher.—C. E., aged 37, was struck on the head when thirteen years old with a small waggon wheel ; had epilepsy when twenty years old and married at twenty-two years. In a fit of frenzy he killed his two-year-old child by catching hold of its feet and beating its brains out. Admitted to the hospital at the age of thirty, he continued violent and homicidal. Trephined. No depression at the seat of injury, the locality of which is not stated, but the temporal region presumably, for at the operation a piece of bone at junction of parietal and temporal sutures was removed. The convulsive fits became gradually farther apart, and, instead of five or six in a month as before, he had not any for six months after his discharge.—(*American Journal of Insanity*, October, 1887, vol. iv. Case 6.)

Ernst Sommer.—Patient, a coachman, aged 25, fell from a ladder and fractured his right temporal bone ; hæmorrhage from right ear. By mistake he was thought to be suffering from "delirium tremens." The temporal area was much swollen. Patient became acutely maniacal and had to be isolated. An abscess formed over the left ear. After surgical intervention and removal of necrosed pieces of bone, he recovered.—(*Zur Casuistik der Gehirnverletzungen*, Berlin, 1874, Case 2.)

Daniel Mollière.—Patient, 41 years of age, was admitted on account of maniacal furor. His roarings terrified his companions. No motor or sensory symptoms, but intense headache. On examining the head a slight wound was found in the left temporal region, just above the external auditory meatus, on a line with the superciliary arch. This wound, about which the patient could give no account, was partly cicatrised and had a fistulous opening. On probing it a fracture of bone beneath was detected. Patient was trepanned and pus was found beneath the dura mater. Two days later he recognised his friends, made sensible enquiries, and after a month left the hospital a normal man. —(*Lyon Médicale*, 3rd April, 1881, vol. xxxvi.)

The same Author. — Patient, 41 years of age, received a kick on the head from a horse. Since the accident he became irascible and violent, and this state increased so much that his family was in terror of him and sent the patient to Dr. Mollière for examination. On examination there was found a wound in the left temporal region, just above the ear, partly cicatrised, partly fistulous. On probing it a fracture of the bone was discovered. Patient was violently maniacal day and

night. An operation was performed with the object of elevating the depressed fragments of the fractured temporal bone. On incising the dura some sticky fluid escaped. The day after the operation the patient answered naturally the questions put to him, but his agitation remained the same. From the second day onwards the mental state gradually improved until he was less and less irritable, and three months after the operation he was reported to be perfectly well. — (*Congrès Français de Chirurgie*, 1885.)

Eg. Hoffmann.—A man of 50 years was struck by a heavy board falling from a great height on to his head. He lost consciousness and became delirious. Afterwards he had attacks of furious mania, in which he caused tremendous destruction in his household, so that he had to be removed to the asylum. He complained of pain in the head. He had no convulsions or any motor or sensory symptoms. On the right side of the head, a little above and behind the external opening of the ear, was found a small but tender depression of bone, about the size of a shilling, which was resected, when on incision of the dura four spoonfuls of cerebro-spinal fluid streamed out. The pia was turbid and œdematous, and more fluid escaped therefrom. The wound healed well, No further attacks of destructive mania, in fact no psychical or physical symptoms of any kind. Discharged cured, and reported himself six months afterwards as perfectly well. — (*Deutsche medizinische Wochenschrift*, 17th May, 1881.)

E. V. Bergmann.—Adolf Heissenstein, workman, 39 years old, fell from a scaffolding about six yards high. When he recovered consciousness he was unable to keep in erect position, and was brought to the hospital. The only marks of injury were on the right side of the head, just above the ear. Patient was as excitable and restless as his helplessness would permit, yet sufficiently so to require attendants to restrain him. He recovered completely after a month. Bergmann assumed a hæmorrhage into the brain, beneath the seat of injury, without any fracture having taken place.—(*Volkmann's Hefte*, No. 190.)

James Howden. J. S., aged 51, received an injury to his head, and became insane. He was restless, raging, and dangerous to others, and so remained until the forming of a large abscess in the left temporal fossa, when he became apparently sane.—(*Journal of Mental Science*, April, 1875.)

A. Spanbock. — *A Boy with Uncontrollable Propensities, probably from Injury to the Temporal Lobe, improved by Craniectomy.*—Lipę Spielmann, a boy of 14, had been physically and mentally slow in development. He teethed only at the end of his second year, and only learned to walk when three years old and began to speak when four years old. He was

sent to school in his ninth year, but made absolutely no progress: took three days to learn one letter and then forgot it. All efforts were fruitless to teach him anything; he did not learn to read, to write, or to count. Morally, also, he remained behind. He thrashed his fellow pupils when he could. The older he grew the more dangerous he became to the family. He had to be constantly watched to keep him from destroying things, or beating or throwing stones at some one. His deeds brought him frequently before the police courts, to the great annoyance of his family. The boy getting worse, a medical consultation was sought. The boy was well built. On admission it was observed that his frame, with the exception of his skull, was regular. The latter showed signs of degeneration: low forehead, big ears, abnormally high palate, teeth widely apart. He also had "tic convulsif" of the right M. orbicularis palpebrarum. The patient could not remain still in any one place (hyperkinesis), he shouted abusive words at everybody (koprolalie), did not reply to questions, or repeated in a senseless manner the questions put (echolalie), or if he did reply, it was with foul words. He could not fix his mind for one second, there was a constant flight of thoughts. He told falsehoods and had a tendency to steal. At the hospital he refused food, but lived on bread which he stole from other patients, but there was some doubt about his stealing acts, since they related to food, and possibly he thought the hospital food was poisoned. He had no sense of decency or feeling for others. The diagnosis was made: imbecility combined with moral insanity. Craniectomy was proposed and carried out. An incision was made in the sagittal line, another vertically down to each ear. The latter incision

revealed the site of a former injury. The tissues above the right ear were adherent to the temporal bone. After several trepannings had been made the bone was cut away, when on the right side the cortex was found œdematous, and looked as if covered with gelatine. (The different motor centres were excited experimentally.) The further course of the operation was normal. When the patient left the hospital, seventeen days after the operation, there was no improvement mentally or morally, on the contrary, the strait-jacket had once to be used. Yet in the course of some months a gradual improvement took place, and after a year his condition was as follows: The patient now behaved properly, did not disturb anybody, showed no inclination for breakage or destruction, but on the contrary tried to make himself useful to his family. He insulted no one, but spoke to the doctor and others politely, and thanked them for their care, and that he had now become a useful member of the family. He remembered his acts before the operation, but could not give any reason for them. Thus, not only did he lose his bad propensities, but he showed higher moral feelings; he was even able to blush. Intellectually, improvement could only take place with education. The surgeon candidly admitted that he did not know what caused the improvement. The operation may have given more room for the development of the still growing brain; the disappearance of the œdema of the brain; even the faradic current sent through the brain, may have had some influence.—(*Neurologisches Centralblatt*, 1895).[1]

Considering these cases of irascibility and violent

[1] Other cases of recovery after operation :—Guider, p. 124; Estlander, p. 127; Ball, p. 128; Wendt, p. 128; Azam, p. 129; Smith, p. 129; Bouchut, p. 163; Meyer, p. 164; Burckhardt, p. 164; Koeppe, p. 165; Williams, p. 165; Schüle, p. 166; Bablett, p. 166.

mania which recovered after operation, it is interesting to note what Dr. Pritchard thought of them. So far from considering the propensities and sentiments as dependent upon or connected with any part of the brain, Dr. Pritchard (*Physiological Survey of the Functions of the Nervous System*) said that he is "acquainted with no fact, either in physiology or pathology, which furnishes any ground for presuming that those mental phenomena take place through the instrumentality of any corporeal process whatever. The irascible madman is a victim of some vexatious disappointment or mortification, which is continually harassing him." Then referring to Gall's account of a boy who displayed morbidly depraved impulses after an injury to the brain, an observation not at all uncommon at the present day, he says:—

"A relation of this kind proves nothing. That an individual at the age of this youth should begin to display the influence of powerful passions on his mind is nothing extraordinary. If stories of this kind gain credit, the College of Surgeons may expect one day to march in triumph, and take possession of the vacant seats of the criminal judges, and we shall proceed forthwith to apply the trepan where now the halter and the gibbet are thought most applicable."

With such views is it any wonder that progress in this department of mental science has been for so long retarded?

6. Tumours of the Temporo-sphenoidal Lobe, giving rise to Irascibility and Violent Mania

A. Hughes Bennett.—Miss A., a young lady, aged 16 at the first consultation complained chiefly of blind-

ness and loss of power in her lower extremities. On interrogating her relatives it was ascertained that her father, although an able man of business, was of excitable temperament and had been subject to several attacks of what seems to have been acute mania. The patient herself had evidently been a precocious child. It is stated that in extreme youth she always exhibited unusual sharpness and intelligence, generally availed of for mischievous or destructive purposes. Her stepmother, a remarkably sensible person, and her elder sisters described her as having always been a "very naughty child," who took a special delight in annoying and playing mischievous tricks on her companions and relatives. She menstruated at the age of eleven, and continued to do so regularly until her illness. Since that period she had been unusually developed, physically and mentally, for so young a person, and she still retained her reputation for wilfulness, cunning, and bad temper, although she could make herself amiable and agreeable if she liked. From a German school she got expelled. Subsequently she went to a school near London, where her behaviour was marked by general misconduct. Six months prior to the consultation, being apparently in robust health, while in an angry fit, and sulking after correction for misdemeanour, she became suddenly blind. As this occurred immediately after correction of mutinous conduct, and she had got the reputation of being extremely cunning and wilful, the schoolmistress and others thought she was malingering. Some few days afterwards she completely recovered her sight. She spent her Christmas holidays at home. On returning to the school, which it seems she disliked, she again stated that she had become perfectly blind, and in addition, deaf. She continued for some weeks in this

condition, when her hearing became completely restored, but the blindness remained. She was attended at different times by several practitioners, who agreed that the symptoms were of an emotional and imaginary nature, and that the patient was hysterical! Four months later she stated that she very rapidly lost power in her lower limbs and that she could not walk. Every now and then she had attacks lasting from one to three hours, which had all the appearances of hysterical fits, involving shouting, laughing, crying, throwing herself about, striking the nurse, etc. Later on she became restless and greatly excited, chiefly at night, and frequently alarmed the household by crying aloud and getting out of bed. The excitement continued to increase, until on the third day there supervened mind-wandering and delusions. She was now totally blind, deaf, and could not stand or move her limbs. She did not know any one. She complained of violent headache. On the fifteenth day she became unconscious and wildly delirious, raving chiefly about some faults she had committed at school. The symptoms continued until the twenty-third day, the patient becoming gradually weaker. She died on the twenty-fourth day.

At the autopsy all the organs were found healthy, except the brain. A tumour, the size of a hen's egg, was discovered in the right hemisphere, highly vascular, with extravasations of blood on its surface. It occupied the medullary substance of the temporo-sphenoidal lobe, bulging the roof of the lateral ventricle.—(*Brain*, April, 1878, vol. i)

Alexander Bruce.—The following case is interesting from the absence of the usual symptoms of cerebral tumour, and from the simulation of hysteria, which deceived every one who saw the patient during the last four months of life, even when careful search for gross intracranial disease was made.

L. M., aged 45, unmarried, previously a nurse; until two years prior to consultation she had been remarkably healthy, of a cheerful and kindly disposition, and had always held good situations. Then it was first noticed that she had become nervous and excitable. Six months later on, it was stated by her sister, patient began to grow very selfish, irritable, and jealous of her sisters; that she would take to fits of laughing and crying, especially the latter, for no apparent reason, and that for some time she had grown so passionate as to be almost unbearable at home. The following month, however, she was able to take a situation as a nurse, and for some nine months seemed in perfect health. Then, however, she began to get excitable, and to quarrel without cause with her fellow servants. Finally her excitement became so great that she alarmed every one by rushing about the house at night screaming. She was seen by two physicians, who were of opinion that her case was one of hysteria, and recommended her removal to her own home. The surgeon who saw her there could discover no signs of intracranial disease; she seemed simply excitable. In the hope of enabling her or inducing her to control her temper, and as she was proving utterly unmanageable at home, she was recommended to go to the country for a time. There she had one of her usual "fits," such as one sees frequently in hysterical subjects, and the medical man who had been summoned recommended treatment by *firmness with kindness.* Two months later she had what appeared to be an attack of paralysis, but what was thought by the physicians to be either functional or "shamming." She was removed, however, to the infirmary, where she died the following month.

The autopsy revealed a tumour extending from the tip of the left temporo-sphenoidal lobe to the junction of the anterior with the middle third of the pons, pushing the convolutions of the temporo-sphenoidal lobe outwards, and pressing on pons and medulla.—(*Brain*, July, 1883, vol. vi.)

Seymour J. Sharkey.—A fatal case of tumour of left auditory nerve, lying between cerebellum and pons with a short nozzle, which was lodged in a cavity in the petrous part of the temporal bone. A later symptom, as a secondary result of pressure, were attacks of violence and refusal of food. He had to be fed through the nose.—(*Brain*, 1889, vol. xi.)

James Rorie.—E. D., female, aged 40, married, not epileptic, dangerous. Hereditary taint. On admission she talked in an excited manner, declaring her husband had abused her, had brought her to a house of ill-fame; and manifested great hatred of him. A year later symptoms of general paralysis, which became, however, considerably arrested. The following year paralysis of the legs, the power over which she seemed temporarily to recover. She continued excited and abusive. She died in a convulsive fit.

Post-mortem examination.—Scalp very attenuated, especially over temporal regions, where the bone was very soft. Brain adherent over both middle cranial fossæ. Between the wall of the petrous bone and the right lobe of the cerebellum there was a tumour, fibro-cystic in character, two inches in diameter. The lateral ventricles were greatly dilated.—(*Journal of Mental Science*, July, 1890, vol. xxxvi.)

James Russell.—Man, aged 27, a very large hydatid cyst in the white matter of the left temporo-sphenoidal lobe outside the lateral ventricle, exerting pressure on corpus striatum and thalamus, and in an outward direction on the convolutions, coming actually to the surface. There was evidence of considerable mental excitement. Three months before his death he threatened his wife's life and was taken in charge by the police.—(*Medical Times and Gazette*, 20th Feb., 1875.)

Sir James Crichton-Browne.—A cancerous tumour of the brain of the right temporo-sphenoidal lobe, absorbing the sphenoid bone and pituitary body and displacing the surrounding gyri. This was taken from the brain of Maria S., a widow, 54 years of age, who was received into the West Riding Asylum. She suffered with fits for half a year previously. A year later she developed attacks of transient excitement. She also, by imperceptible degrees, lost the use of the left side. She was garrulous. Her appetite for food was at times voracious.—(*British Medical Journal*, 26th April, 1873.)

John H. Arbuckle.—M. H., aged 44, single, by occupation a weaver, was admitted to the West Riding Asylum. The medical certificate accompanying her stated, that she had great nervous excitement, great garrulity and gesticulation, and that she was dangerous. She was not epileptic. She kept proving troublesome, excited, restless, and quarrelsome up to her death.

Post-mortem.—On removing the brain a large, irregularly shaped tumour was found occupying the right temporo-sphenoidal fossa, adherent to the bone and to the

under surface of the right temporo-sphenoidal lobe, which was found softened and broken down to the extent of three inches.—(*Glasgow Medical Journal*, July, 1876, vol. viii.)

Sir Samuel Wilks.—A man, aged 26, was sent from Guy's Hospital to Colney Hatch Asylum, being maniacal and unmanageable. He died after 15 months and a tumour in the temporo-sphenoidal lobe was found involving the pons and cerebellum.—(*Guy's Hospital Reports*, 1866, vol. xii. Case 66.)

Henry M. Hurd.—G. W. J., aged 37, an artisan, a general paralytic, given to violence, was found, post-mortem, to have a gummy tumour in the temporo-sphenoidal lobe.—(*American Journal of Insanity*, July, 1886, vol. xliii.)

H. Schüle.—Jacob Hock, aged 56, admitted for furious mania with impulses to violence and destruction, tearing whatever was within reach. Patient developed enormous gluttony. His speech was most obscene. Numerous fainting fits; he died in one of them.

Post-mortem.—Two gummuta at the tip of the left sphenoidal bone in the thickened dura mater which adhered to the brain substance.—(*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874, Case 5.)

Otto Snell.—Wilhelmine B., a servant, was mentally and bodily well until her 28th year, when she became subject to epileptiform attacks, which were followed by violent mania lasting several weeks. She died in a convulsion six years later.

Post-mortem.—There were five cysticerci in the brain substance at the base of the temporal and frontal lobes and one in the corpus striatum.—(*Allg. Zeitschrift für Psychiatrie*, 1875, vol. xxxii.)

A. Richter.—Ferdinand Bülow, aged 50 years, suffering from epilepsy, had paroxysms of fury during ten years. On admission acutely maniacal.

Post-mortem.—The inner side of the temporal lobe contained a glioma, which extended anteriorly between the two frontal lobes and posteriorly as far as the occipito-temporal convolution, and involved the two anterior cornua, the gyrus uncinatus and fornicatus, island of Reil and adjoining temporal convolutions.—(*Ibidem*, 1883, vol. xxxix.)

Jul. Jensen.—Describes the case of an idiot who loved teasing, and creating disturbances, who was irascible, violent and particularly dangerous to children, who had a cyst filling up his entire left temporal lobe; only the anterior part to about the size of a walnut was preserved.—(*Ibidem*, 1889, vol. xlv.)

W. Fraenkel.—Mrs. Ho., aged 58, widow, childless, known to Dr. Fraenkel as being ever of joyful temperament and sound constitution, came one day to him with right-sided hemiplegia and a certificate describing her as "dangerous." The hair in the left temporal region had turned grey and was in parts falling off.

On post-mortem examination a tumour, size of a child's fist, was discovered in the temporal region, thinning the bone. The local discolouration and thinning of hair was ascribed by the author to the tumour growth.—(*Ibidem*, 1896, vol. lii.)

Dr. Kaplan.—A nursemaid, aged 32, suffered for about four years from great irritability and sudden attacks of anger, after which she sometimes became aphasic. She had attacks of giddiness and loss of consciousness for twelve months. During the two years she was at the asylum she proved very excitable, without any cause, exaggerated little matters, and was continuously quarrelling with the other patients. She had outbursts of fury and made obscene remarks. During the last weeks of her life she suffered with headache, giddiness, and vomiting.

The necropsy revealed a tumour occupying nearly the whole base of the temporal lobe.—(*Ibidem*, vol. liv.)

Jacob Weiss.—H. D. F., a potter's assistant, aged 51, was, on admission, in a state of acute maniacal fury. He tore his clothes off his body, jumped and rolled about on the floor, shouting, kicking, biting, and rendered a medical examination impossible. It was ascertained that patient had clonic convulsions of his right extremities for a year, and that the fits during the last few weeks had continued daily. For the first four days of his confinement there was no change in the patient's mental condition. The maniacal excitement went on day and night, patient striking the door so violently with his hands and feet as to produce numerous excoriations. In the end he got exhausted, fever set in, strabismus divergens, and facial paralysis on left side. He died of pneumonia a month after admission.

Post-mortem examination.—A tumour, size of a walnut, was found embedded in left temporal lobe, and extended along the base to anterior part of the pons and left crus.—(*Wiener medizinische Wochenschrift*, 1877.)

E. K. Hoffmann.—Gliosarcoma in left middle fossa with considerable dilation of both lateral ventricles. Patient, W. T., a woman, aged 67, was subject to paroxysms of fury and dangerous to those about her.—(*Zeitschrift für rationelle Medizin*, 1869, vol. xxxiv. Case 2.)

E. Klebs.—Case of a man, aged 33, whose mental symptoms were violent anger with paroxysms of fury. He had a neuroglioma in left temporal cortex.—(*Prager Vierteljahrschrift*, 1877, vol. cxxxiii.)

K. Oppenheim.—F. Sch., aged 47 years. For eight months great irascibility; mere trifles excited anger. Subsequently convulsions on right side, aphasic, headache and vomiting.

Autopsy.—Sarcoma in left temporal lobe and corpus striatum.—(*Archiv für Psychiatrie*, vol. xxi., 1890, Case 7.)

Dr. Lindström.—Male, aged 55, fracture of temporal bone when twenty years old, healed completely. Paroxysms of fury every three or four weeks. Headache in right temporal area. Vomiting.

Post-mortem.—Tumour in right temporal lobe adherent to dura mater; recent hœmorrhage into surrounding substance.—(*Hygiea*, vol. xviii.)

Dr. Rousseau.—B., epileptic for six years. After attacks he suffered from furious mania. Threw himself on persons near, trying to do them injury. He was so dangerous that he had to be placed in a cell alone. In lucid intervals he was a melancholiac.

The autopsy revealed hypertrophied Pachionian bodies in the parietal region of each side, two of which were veritable tumours. At base of temporo-sphenoidal lobe was a tumour 25 mm. in diameter, weighing 15 grammes. Rest of brain normal.—(*L'Encéphale*, 1888, vol. viii. Case 1.)

The same Author.—R., aged 33, became epileptic after a fright when ten years old. After the attacks he suffered from violent mania and became dangerous to his surroundings. As years went by he became more and more irritable and aggressive.

Post-mortem.—At the base of temporo-sphenoidal lobe, encroaching on the orbital convolutions, was a tumour, size of a pigeon's egg, weighing 25 grammes, compressing the neighbouring parts.—(*Ibidem*, Case 2.)

Dr. Geoffrey records the case of a single woman, aged 54, with a large cancerous tumour of the temporo-sphenoidal lobe involving the lateral ventricle, who, a fortnight before admission, became a violent maniac, and remained in that condition up to her death, six months afterwards. —(*Annales médico-psychologiques*, 1865, vol. v.)

Philippe Rey.—Male, aged 70, tumour of temporo-sphenoidal lobe. Paroxysms of fury.—(*Choix d'observation prises à l'hôpital de Bordeaux*, Paris, 1834.)

Other cases of tumours in the temporo-sphenoidal lobe, accompanied by symptoms of abnormal agitation, excessive irritability, and violence, are the following :—

Sir W. T. Gairdner, *British Medical Journal*, 28th April, 1877.
Another in the same journal, 28th September, 1873.
H. Lutz, *Bayer. Aerztl. Intelligenzblatt*, 1864.
Ernest Chambard, *L'Encéphale*, 1881, vol. i.

7. Tumours of the Temporal Lobe leading to Violent Mania and Epilepsy

T. S. Clouston.—The patient, J. R., male, aged 38, married, butcher. No hereditary predisposition. Had shown symptoms of insanity for four years. His first mental symptoms seem to have consisted of a change in temper, great irritability, and an altered affection for his wife and family. His first bodily symptoms were intense cephalalgia, slight deafness, and gradually increasing blindness. He had been getting mentally much worse, being excessively irritable, violent towards his wife and daughters, very abusive and foul in his language, and then accusing his wife of all such violence. During twelve months before admission he had had several epileptic attacks. On admission he proved sharp and intelligent, and had no delusions; gait of a tipsy man. He was quite blind, and deaf in his right ear. In nine months his legs were paralysed. It was noticed during the first fortnight already that on the very slightest provocation he became wild with passion, completely losing control over himself and capable of doing any violence to those about him. This excessive irritability with violent paroxysms of pas-

sion, often coming on without any cause, were his chief mental characteristics during the remainder of his life. He died ten months after admission.

Post-mortem.—A tumour attached to right side of cerebellum and the fibrous portions of the temporal bone, having caused absorption of the bone and disorganised the internal ear of that side. It pressed on the lower portion of the temporo-sphenoidal lobe, causing complete softening there, so that the fluid in the lateral ventricle ran out at that part when lifted.—(*Journal of Mental Science*, July, 1872, vol. xviii., Case 1.)

The same Author.—A. W., male, aged 19, admitted into the asylum suffering from epileptic mania. He was described as very violent before and after these attacks. On admission he was found to be a muscular youth, with well-nourished frame. Mentally he was irritable and excitable, took offence at trifles.

Post-mortem.—Tumour found at base of brain in the extra-ventricular portion of the left corpus striatum.—(*Ibidem*, Case 2.)

W. Herbert Packer.—A. Y., female, aged 15, was admitted into the Salop and Montgomery Asylum suffering from epileptic dementia; her noisiness, irritability, and restlessness rendering her unmanageable in the workhouse. She had fits for three years. Previously she was fairly intelligent. On admission she was thin and in poor health. Mentally she was exceedingly irritable and spiteful, slapping any one who touched or moved her, and crying out in a peevish manner if restrained.

Post-mortem.—Much purulent matter was found in the meshes of the pia mater, between the convolutions at the base of the brain, where a tumour 1½ inches in diameter, afterwards proved to be a round-celled sarcoma, projected from the right temporo-sphenoidal lobe, pushing the neighbouring parts aside.—(*Ibidem*, October, 1882, vol. xxviii.)

Conolly Norman.—N. B., male, aged 27, suffered from fits seemingly of an epileptic nature. He was blind from atrophy of the optic disc. No motor paralysis. He was rather noisy. Clinical history is lacking.

Post-mortem.—Over the lesser wing of the sphenoid on the right side, embedded in the right temporo-sphenoidal lobe, was a tumour size of a golf ball; it proved to be endothelioma.—(*Ibidem*, July, 1893, vol. xxxvi.)

Byrom Bramwell.—R. C., aged 23, a sailor, was admitted complaining of intense pain in the left temple and left ear, difficulty in speaking, and fits. Syphilis seven years before admission to the hospital. Severe secondary and tertiary symptoms. On admission: the left temple swollen and tender to the touch; the swelling was hard, and extended backward towards left ear. Patient was intelligent and well educated. He slept badly and was much disturbed by dreams. He had severe convulsions. He improved so well within a few months that he became an out-patient. He now felt sufficiently well to be able to take a situation as a brewer's travelling clerk, but nine months later his fits recurred; he became stupid and childish and had to be re-admitted. On re-admission he was for several days quite wild and unmanageable, throwing himself about and talking excitedly. He recovered sufficiently to attend from

time to time as an out-patient.—(*Edinburgh Medical Journal*, 1879, vol. xxiv., Case 4.)

C. Bouchet.—Female epileptic, aged 45, irascible ; tubercle, size of a cherry, in temporal lobe. Cornu Ammonis of both hemispheres sclerosed.—(*Annales Médico-psychologiques*, 1853, Case 19.)

Gros. R. Trowbridge.—J. C., male, aged 47, single, of no occupation. Family history good, became epileptic at the age of thirty-seven after some fever. The epileptic seizures increased in number and severity. At certain periods he was inclined to be excited and even violent, and it was noticed that this excited state was in inverse ratio to the number and severity of the epileptic attacks. During his excited period he destroyed clothing and denuded himself. On one occasion he wandered away from the hospital. When the epileptic treatment was discontinued his attacks increased, and he became troublesome, irritable, and excited.

Autopsy.—Dura mater adhered to base of skull and was somewhat congested. Entire grey matter of right temporal lobe soft and almost fluctuating.—(*Journal of Nervous and Mental Disease*, April, 1891, vol. xviii.)

E. Klebs.—An epileptic, aged 33, apparently of normal intelligence, intent on provoking his comrades to quarrel and always ready to strike. He continually robbed folks of their property and did not shrink from resorting to violence to obtain the articles hankered after. The continuous quarrels necessitated his isolation.

Autopsy.—Neuroglioma of the base of the left frontal and temporal lobes compressing the latter on the petrous bone.—(*Vierteljahrschrift für die praktische Heilkunde*, *Prag*, 1877, vol. cxxxiii.)

C. Bauze.—Anton Knesche, a boy, $4\frac{1}{2}$ years old, got from most insignificant causes into wild excitement. A year later, without any prodromata, he had a convulsive fit, in which he lost consciousness, leaving him with facial paralysis. More fits during the following two months, at the end of which he died.

The post-mortem examination revealed great dilatation of ventricles, holding 4 to 6 ozs. of serum. Several tubercular nodes in both temporo-sphenoidal lobes.—(*Jahrbuch für Kinderkeilkunde*, 1876.)

Dr. Wardrop.—Two cases of osseous tumours removed from the meninges of the temporo-sphenoidal lobes in patients suffering from acute mania.—(*Lancet*, 19th May, 1826.)

8. Inflammatory Lesions of Temporal Lobe leading to Irascibility and Violent Mania

H. Schüle.—Hy., aged 39, two years previous to admission showed inability for mental exertion, combined with indecision, which failing worried him. There was temporary paresis of the left hand. The mental torpidity increased, he got bad-humoured, and more peevish. Later on he became acutely maniacal, broke out into a fury, throwing over and smashing furniture, and, after admission, his excitement

seemed to be ever on the increase. He had several epileptic attacks with temporary hemiplegia and total aphasia. He died of pneumonia.

Both temporal lobes were atrophied. In the left there was the remains of a gummatous infiltration.—(*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874, Case 4.)

The same Author.—M. Mair, aged 30, was admitted on account of an increasing mental excitability and intense headache. He soon became violently maniacal, with a stormy motor restlessness, shouting and destroying everything in the room, and threatening those approaching him. Opium relieved him only temporarily, then the scenes of violence and destruction began anew. Pulse and temperature rose proportionately with the degree of excitement. Much grinding of the teeth. No paresis. Two months after admission he died from convulsions.

Post-mortem.—The anterior part of the temporal lobe and the whole of its base were softened, but the lesion did not involve any of the basal ganglia.—(*Ibidem*, Case 6.)

The same Author.—Jacob Hock, aged 56, watchmaker, had furious mania with impulses of violence and destruction, At the same time a voracious appetite. His speech was most obscene, and his destructive mania knew no bounds. He died after a month's illness.

Post-mortem.—The right temporal bone was thickened, especially at its anterior border. Pachymeningitis interna of the middle fossa, with old and recent hæmorrhages. Two gummata in the dura of the left petrous bone.—(*Ibidem*, Case 11.)

Ludwig Meyer.—Wilhelm H., stonemason, aged 33, had overworked himself, being anxious, as he said, to save some money for his children. One day being exposed to the sun for a long time, he fainted. Since that time he, who was previously of an exemplary and peaceful disposition, became irascible. He had a delusion that he might starve, and to save himself he often asked excessive wages for his work; at the same time the results deteriorated so much that he had to be discharged. Now he set about thieving; for some days he stole loads of fish, another time a cartload of wood. In the institution he loved playing at cards, but was only pleased when he could win. Before his admission he had shown great love for his children, while coincidently threatening them with knives and a hatchet, and frequently beating them. He admitted that he was then subject to paroxysms of anger. In the institution he was noisy and destructive. He died from an apoplectic stroke.

Post-mortem.—An exostosis of the left temporal bone. A cyst in the anterior part of the left temporal lobe, with degeneration of the surrounding brain tissue.—*Archiv für Psychiatrie*, Berlin, 1872, vol. iii., Case 38.)

Prof. Fürstner and Dr. Stühlinger.—Reibold, a married woman, aged 47 years of age, irascible from childhood, in continuous conflict with her husband. On admission noisy, abusive, aggressive. Died after eight months.

Post-mortem.—The left temporal bone was bulging, and both temporal lobes were tougher. They had a yellowish discoloration and numerous granules on their surface the size of pins' heads, especially at the middle of the second temporal convolution. —(*Ibidem*, 1886.)

Th. Zacher.—E. Schweblin, aged 27, had paroxysms of irascibility, in which he became very abusive and aggressive.

Post-mortem.—Rusty deposit in the right middle fossa: immense dilatation of lateral ventricles.—(*Ibidem*, 1888, vol. xix., Case 2.)

A. Alzheimer.—R. S., a woman, aged 42, complained of headache and irritability. Easily roused to anger. Grew mentally feeble. Delusions about being murdered. Died of pneumonia.

Post-mortem.—Encephalitis of frontal, but more so of temporal lobe, where a whole piece of brain substance adhered to and came away with the meninges.—(*Ibidem*, 1897, vol. xxix.)

M. Köppen.—H. G., aged 41, became gradually irascible, and after an apoplectic stroke, with temporary hemiplegia, the irascibility increased so much that his admission to the asylum became necessary. Dementia. Ideas of exaltation. Grinding of teeth, and as restless as his helpless condition would permit. Marasmus. Death after two years' illness.

There were the usual post-mortem signs of dementia paralytica, but in addition the temporal lobes showed so much softening that they were all in pieces.—(*Ibidem*, 1896, vol. xxviii., Case 3.)

The same Author.—Julius H., aged 46, after several other injuries, had one day a fall on the stairs, and when attended to, became restless, and resisted all help. He remained in a stuporous condition for two days. Afterwards headache. No other symptoms. In a few days a paroxysm of furious mania set in, lasting for a month, and leaving him mentally confused. He died of broncho-pneumonia after nine months.

Post-mortem.—Focal softening of right temporal lobe close to the cortex.—(*Ibidem*, 1898, vol. xxx.)

G. H. Bergmann.—Maria B., on admission, 24 years of age, became acutely maniacal after a disappointment in love.

Post-mortem.—The structures in the middle fossæ were found inflamed.—(*Allg. Zeitschrift für Psychiatrie*, 1846, vol. iii., p. 189.)

L. Willé.—M. M., aged 37, had attacks of violent temper; in the intervals he was quite kind-hearted. Eight weeks before admission, after some excesses of "fast" life, he grew extremely violent, and made murderous attacks on people, in consequence of which he was bound and brought to the asylum. There he remained in a state of violent mania for fourteen days; after that the attacks of fury and aggressive tendencies became paroxysmal. Before his death, a year after his admission, his excitement and destructive tendencies increased anew. He died of phthisis.

Post-mortem.—There was thickening of the arachnoidea, with tubercular nodules, chiefly at the basis of the left temporal lobe.—(*Ibidem*, 1875, vol. xxxii., Case 5.)

B. Ascher.—A man, 45 years of age, was admitted on account of violent mania.

The post-mortem examination revealed atrophy and softening of both temporal lobes, more marked in the left than in the right.—(*Ibidem*, 1893, vol. xlix.)

Carl Fröhlich.—E. K., aged 53, a tailor, married, received a blow on the head, after which he suffered from furious mania.

The post-mortem examination revealed numerous exostoses of the anterior part of the petrous portion of the temporal bone.—(*Ibidem*, 1875, vol. xxxi., Case 7.)

The same Author.—R. S., aged 35, suffered from mania furiosa after a fever.

The post-mortem examination revealed adhesion of the meninges to the right middle fossa of the skull. The right cornu ammonis was shortened.—(*Ibidem*, Case 32.)

M. Mariani.—Patient, a woman, aged 31, was admitted for the third time for furious mania. She complained now of severe headache in the right temporal area, and four months later fœtid pus escaped from the right ear. The whole right temporal area became œdematous. Four weeks later she died under symptoms of pressure on the brain. No motor or sensory symptoms.

Post-mortem.—The autopsy revealed caries of the right temporal bone and an abscess, the size of a walnut, in the temporal lobe.—(*Archivio ital. per le mal. nervose ecc.*, 1886, vol. xxiii.)

Dr. Rasori.—A patient, aged 45, was admitted into the asylum in a state of acute delirious mania. The patient died within eight days.

The necropsy revealed, besides congestion of the meninges, softening of the cortex in the right temporo-sphenoidal lobe.—(*Centralblatt für Bakteriologie*, vol. xiv.)

Otto Körner records a case of destruction of the left temporo-sphenoidal lobe, including Wernicke's sensory speech-area, without any affection of speech or hearing, but a change of character from sweet to bad temper.—(*Berliner klinische Wochenschrift*, 1885, vol. xvii.)

H. Lutz.—Case of a man, 30 years of age, who since his illness showed great mental irritability, and antagonism against his wife and child. He was quick-tempered; could not stand contradiction. Later on mental weakness. Stupor varied with abnormal excitability.

The autopsy revealed a large abscess occupying the left temporal and frontal lobes.—(*Bayer. Arztl. Intelligenzblatt*, 1864, p. 484.)

Dr. Bleynie.—Monin, aged 55, became suddenly violently maniacal. His delirium and agitation continued after his admission, and in addition a voracious appetite (*appetit devorant*) was noted. After fifteen days the acute mania disappeared spontaneously and recurred at intervals until ten months after its first appearance, when patient died without any premonitory symptoms.

The autopsy disclosed thickening of the arachnoid in the middle fossa of the skull and an abscess in the temporo-sphenoidal lobe communicating with the right external ventricle. Brain healthy otherwise.—(*Dissertation sur l'Inflammation du Cerveau*, 1809).

J. Luys.—Elisa, 28 years of age, admitted for acute mania. She was hemiplegic on the left side for four years. She was noisy, and disturbed her neighbours all night.

Post-mortem.—There was softening of the right temporo-sphenoidal lobe.—*L'Encéphale*, 1881, vol. i., Case 2.)

Dr. Labory.—P. Louise-Marguérite, aged 28, died of caries of the petrous bone and suffered from agitation and delirium.—(*Bulletins de la Société Anatomique de Paris*, vol. xlii., 1867.)

J. Christian.—Caillebotte, developed in prison acute maniacal delirium. He was transferred to the asylum, his agitation continuing. One morning he was found dead in bed.

Post-mortem.—There were injection and adherence of the membranes in both temporal regions, and much serous fluid escaped on their incision. There was recent hæmorrhage in the left orbital fossa, which the surgeon assumed was the cause of the patient's sudden death.—(*Annales Médico-psychologiques*, 1874, vol. xii., Case 6.)

Erc. Firrarir.—A farmer, 32 years of age, suffered for years from headache, which suddenly got worse. He broke out into furious mania. He fell into the water and was drowned.

Post-mortem.—There was asymmetry of the skull and hyperostosis of the petrous bone.—(*Gaz. Med. Ital. Federat*,, Lomb., 1851.)

Clovis Gallopin.—Louis Cheval, aged 61. His mental derangement began three years previous to admission. He threatened and beat his wife, tore his clothes, and broke anything he could lay his hands on. He had a tendency to steal and to obscene acts. He was admitted for violent mania. He cried and shouted all night long, and six days after admission was found dead in bed.

Post-mortem.—The pia mater was injected over the left temporal lobe and left hemisphere of cerebellum. There was softening of the inferior parietal lobule and the posterior part of all the temporal convolutions on the right side and inferior and middle temporal convolutions on the left side.—(*Annales Médico-psychologiques*, Sept. 1879, Case 2.)

M. A. Foville.—M. K., 36 years old, a violent maniac.

Post-mortem.—The membranes were adherent to the temporal lobes.—(*Ibidem*, 1882, 6th series, vol. vii.)

H. Voppel.—An imbecile, 37 years of age, voracious and irascible.

Small head with osteophytes of the petrous bone and the dura adherent to the middle fossa of the skull.—(*Zeitschrift für Psychiatrie*, 1857, vol. xiv.)

T. R. Glynn.—John H., aged 36, with advanced phthisis. Mentally normal until two months prior to his admission, when his manner became strangely altered. He was decidedly irascible, fidgety, restless, tossing about, and once struck savagely the clinical clerk.

Post-mortem.—There was found an embolic obstruction of the left posterior cerebral artery, softening of the lower part of the left temporo-sphenoidal lobe, which had in its outer third a cavity, size of a large hazel-nut.—(*British Medical Journal*, 28th September, 1878.)

Lauder Lindsay.—Case of acute mania.

The chief pathological conditions revealed by the necropsy were the following :—The cortical substance of the middle lobe of the left hemisphere of the brain, in proximity to the petrous bone, and opposite the left ear, contained a series of small circumscribed abscesses, full of thick, curdled, greenish pus. In a corresponding position on the right side of the brain, the abscesses, originally separate, had condensed and become diffuse, the pus burrowing between the convolutions and beneath the membranes, the adjacent cerebral substance being soft and almost diffluent.—(*Thirty-third Annual Report of Murray's Royal Asylum near Perth*, June, 1860, p. 20.)

R. B. Mitchell.—J. H., 52, married, engine-fitter, was admitted to the Royal Edinburgh Asylum. Some years before he had received a heavy blow from a hammer on the left side of the head, and had to stay in hospital for a short time. He married at thirty years of age, and was the

father of six children, of whom four were alive and healthy. About two years prior to his admittance he began to suffer from severe pains at one spot in the right temple, and not long afterwards in the left temple also. Nine months after he had convulsive fits, which diminished in number and severity under treatment by iodide of potassium. About a fortnight before his admission he grew restless and sleepless at night, and muttered a great deal to himself. These symptoms grew worse and then he threatened violence to his wife and children. Mentally patient showed signs of enfeeblement, and his memory was much impaired. During the first week of his stay in the asylum he was generally very restless, and was sleepless and excited at night. He once struck an attendant without any apparent reason. During the second week he was more restless and excited than before, and at night used to try to tear open the window shutters of the dormitory where he lay. Shortly before his death a change occurred. He became quiet.

Autopsy.—Tumour the size of a hazel-nut in the right frontal lobe. Around the middle portion of the central fissure the meninges were greatly thickened and glued firmly together. The right temporo-sphenoidal lobe was soft almost to diffluence. The mitral and aortic valves were incompetent.—(*Edinburgh Medical Journal*, Nov., 1883, vol. xxix., Case 2.)

Wm. Julius Mickle.—J. M., soldier, aged 33, was found, post-mortem, to have rather extensive changes in the membranes and brain in the frontal regions, but most marked in the middle fossæ, where there was a false membrane, and where the temporo-sphenoidal lobes were eroded. There was tenderness over the temples during his illness. Patient was neither suicidal nor epileptic, but dangerous to others. The disease developed suddenly with homicidal impulses. He was restless, meddlesome, irritable, quarrelsome, foul and obscene in his language, and dirty in his habits. —(*Journal of Mental Science*, Jan., 1880, vol. xxv. Case 6.) Cases 1, 2, and 3 are very similar.

Kenneth M'Leod.—D. S., aged 74, seaman until his sight and bodily powers began to fail, some twelve years previously. During the first six years his intellect kept sufficiently good, after that it began to get weaker. During these six years he manifested a tendency to accumulate, but did not express any delusive belief in, wealth or social position. At last he became troublesome and unmanageable at home, so that he had to be sent to the workhouse, and from there to the Durham County Asylum. He then had symptoms of general paralysis in a most advanced stage. He had disease of the aortic valve. He died a month later.

Post-mortem.—The left temporo-sphenoidal lobe was found greatly softened and converted into a grey pulpy matter.—(*Ibidem*, 1861, vol. vii., Case 2.)

J. Mackenzie Bacon.—William G., aged 57, kept well till within a few days of his admission into the Cambridgeshire Asylum, when he became noisy and excited. When admitted he was in a state of restless delirium. He was fed with the greatest trouble, resisting all efforts in a blind fury, without any particular object. There was no headache, vomiting, or intolerance of light. He continued in a state of restless excitement for eleven days, when he died.

Post-mortem:—On removing the dura mater there was a large, thick, greenish lymph, limited to the left hemisphere and extending over the middle fossa of the base of the skull to the foramen magnum.—(*Ibidem*, 1869, vol. xiv.)

T. Duncan Greenlees.—Hanna Eliza F., aged 56, single, was suffering from acute mania, restless and sleepless at night but perfectly coherent. There was incompetence of the aortic valve, otherwise she enjoyed good health for five years of her residence. Then she had an apoplectic seizure accompanied with aphasia, and six months afterwards she died in a second seizure.

Autopsy.—There was blocking of the left meningeal artery and softening of the left temporo-sphenoidal lobe. —(*American Journal of Insanity*. April, 1887, vol. xliii., Case 3.)

The same Author.—William B., aged 32, was an imbecile, liable to outbursts of violent excitement, and passionate if interfered with. For nineteen years he continued in much the same condition mentally. Then he developed cardiac disease, had an attack of right-sided hemiplegia and aphasia. He died the year after.

Autopsy.—There was in the left hemisphere a large patch of yellow softening 4 inches by 3 inches in extent, involving the whole of the island of Reil with the inferior frontal and anterior portions of the superior middle temporo-sphenoidal convolutions, and extending towards the corpus striatum.—(*Ibidem*, Case 4.)

Adolph Meyer.—Case 144, a woman of 56, came to the hospital with what is called infantile hemiplegia, characterised by lack of development of the right side of the body. She was an epileptic. She was very abusive and aggressive.

The autopsy revealed a large defect in the left temporal lobe. The middle part of the fourth and fifth temporal convolutions was completely absent, nothing but a membrane forming the wall of the cavity.—(*Ibidem*, Oct. 1895, vol. lii.)

9. Abnormal Development of the Temporal Lobes

Warren L. Babcock.—Case 1952. Excessive bulging of the temporal bone on right side, making the head prominently asymmetrical. F. C., female; age 31; single; native of New York; habits good; tendencies, destructive and criminal in character. During childhood she was eccentric and unruly, markedly disobedient, perverse in her tastes, irritable on slight provocation,

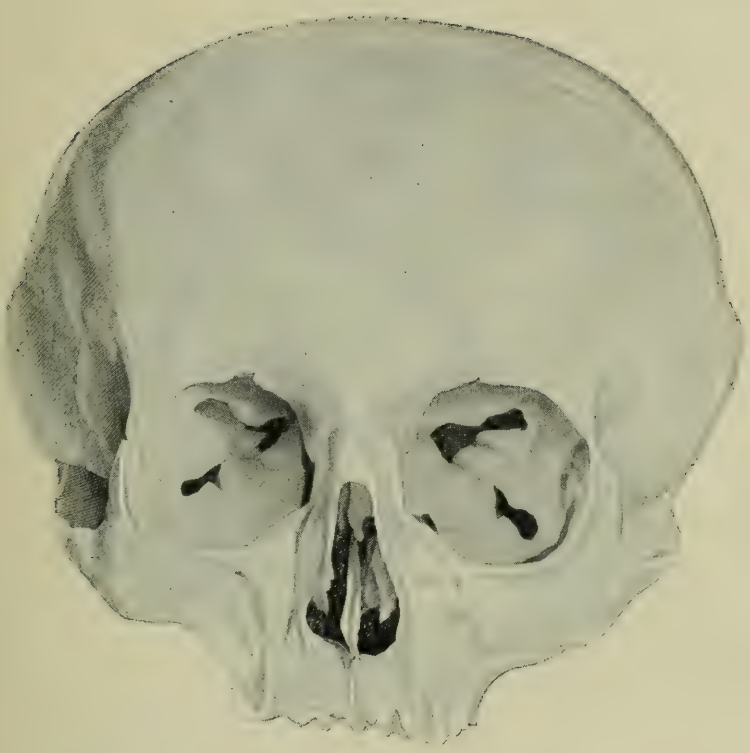
and when angered would fly into a passion, become destructive and greatly overwrought. This would soon pass away, but it was noticed that as the child grew older she became worse, less susceptible to control, and developed sundry degenerate traits of character. From the father's statement it seems that the girl reached the age of 18 without very serious trouble, maintaining a fair self-control with only an occasional manifestation of viciousness. At the latter age, however, she had a serious outbreak, and for several weeks lost entire control of her mischievous and perverse tendencies. This was followed by a somewhat tumultuous interval of four years, at the end of which she again had an outbreak extending over a like period of time. She threatened her parents with a knife, broke dishes and furniture, and was a menace to the family safety except when in presence of her father. Throughout the earlier months of her residence in the hospital she was subject to paroxysms of fury and destructiveness, during which she was mischievous, vicious, and subject to great mental restlessness. During one of these she seized a bottle of camphor and chloral liniment from a nurse and drank a portion without subsequent injury. She repented of her rash act immediately afterwards and regretted that she was unable to control her impulses. She remained excited and disturbed for four months, and then began to improve rapidly, becoming quiet, orderly, and finally manifesting few perverse tendencies.

Second admission (fourth outbreak), was after an interval of three years. During this period she was turbulent and mischievous but maintained fair control. Her second residence in the hospital was manifested by a repetition of her former excesses. If anything, this

last attack was marked by an increase in vicious and destructive tendencies. Some of her mischievous acts seemed to be premeditated, while others had the appearance of being entirely impulsive. She would emphatically deny all of her behaviour which was unobserved, but readily traceable to her as the offender. When discovered in any of her depredations she acknowledged her guilt with profuse regrets, and promised to restrain herself in future, but, nevertheless, would take the first opportunity and from time to time attack slyly fellow patients when nurses were not looking. One minute she would talk sociably and kindly with an associate, while the next, if unobserved or if the converser's attention was distraught, she would strike a violent blow with anything which might be ready at hand to inflict injury. She seemed to appreciate the enormity of her offences, and regretted her lack of self-control. She was a confirmed kleptomaniac, and exhibited a high degree of secretiveness following upon her lapses. She was also a pyromaniac, having on one occasion set fire to her father's residence.—(*State-Hospitals Bulletin*, New York, Jan., 1896.)

Dr. Arnold Pick describes the case of a man who was brought to the asylum strapped down on an ambulance by the police, he having become suddenly acutely maniacal, was threatening to kill some one, and could only be overcome by the combined strength of several men. On the following day patient was calm and perfectly normal. He gave his history correctly, and stated that he always got easily excited to acute anger, but that the anger as rapidly disappeared. The cause in this case arose within himself ; some reflections about past events made him angry, and his fury increased at the attempts of wife and friends to pacify him. On examination an asymmetry of the head was noticed. The left temporal bone bulged so much that it formed a perfect groove at its junction with the frontal and parietal bones. No other evidence of disease or other abnormality could be found.—(*Prager medizinische Wochenschrift*, 5th Nov., 1879.)

H. Voppel.—CASE 2. Patient 47 years of age, imbecile from birth, voracious, had a propensity for ill-treating and killing cats, was very



From Gall's Atlas (reduced).

Skull of a woman convicted of **robbery** and **violence,** who died in prison at Graz.

Notice the similarity to Plate XIX., p 350, and to illustration on p. 491.

revengeful when roused to anger. Had a small head with bulging temporal bones.

Case 4. A similar broad-head, in whom adhesions of the cornu ammonis and dilatation of the ventricles were found after death. Patient was an imbecile, 51 years of age ; an active pyromaniac.

Case 15. A similar head. Also adhesions of cornu ammonis. Imbecile, 30 years of age, voracious, aggressive, biting, and striking.

Case 17. An imbecile, 29 years of age, given to personal violence. He had a large head of unusual width, a thick skull, but the temporal bones were transparent. The large foramina of the base of the skull were narrowed.—(*Allg. Zeitschrift für Psychiatrie*, vol. xiv., 1857.)

That great mental activity of furious mania should cause an increase in the size of the brain and skull when chronic can cause no wonder. Dr. Obernier's measurements of eleven patients with mania furiosa showed in nine of them an immense excess in the size of the head as compared to the normal. The two heads which were below the normal were those of women.

Cases of Hæmorrhage in Middle Fossa of Skull with Symptoms of Irascibility and Violent Mania

H. Voppel, Cases 24 and 48, *Allg. Zeitschrift für Psychiatrie*, 1857, vol. xiv.

A. Eichholt, Case 2, *Ibidem*, 1885, vol. xli.

E. Kundt, three cases, *Ibidem*, 1894, vol. 1.

Theodor Kres, *Ibidem*, 1895, vol. li.

E. K. Hoffmann, *Vierteljahrschrift für Psychiatrie*, 1869, vol. ii.

Dr. Tiling, *St. Petersburger med. Wochenschrift*, 7th July, 1879.

M. A. Foville, *Annales médico-psychologiques*, vol. v., 1871.

Judson B. Andrews, *American Journal of Insanity*, vol. xxv.

T. Kirkbridge, *Ibidem*, Oct., 1879, vol. xxxvi.

Pressure on Temporal Lobes from Neighbouring Parts (Dilatation of Ventricles, etc.), with Symptoms of Irascibility and Violent Mania

F. St. John Bullen noticed that dilatation of the ventricles, when it occurs, is usually conjoined with symptoms of acute mania. Such cases are :

Kenneth McLeod, *Journal of Mental Science*, 1861, vol. vii., Case 1.

J. T. Satten, *Ibidem*, April, 1870.

James Rorie, *Ibidem*, July, 1890, vol. xxxvi.

R. Southey, *Lancet*, 13th December, 1879.

T. Duncan Greenlees, *American Journal of Insanity*, April, 1887, vol. xliii.

David D. Davis, *Acute Hydrocephalus*, London, 1840.

Dr. Bremont, *Bulletins de la Sociétié Anatomique de Paris*, 1867, vol. lxii.

Dr. Cornil, *Progrès Médical*, 1874.

Dr. Gualardi, *Bull. delle Soc. Med. de Bologna*, 1842.

H. Schüle, Cases 4, 7, 10, and 11, *Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874.

Landerer and Lutz, Cases 11, 14, 15, 18, and 26, Report of Private Asylum "Christophsbad" in Goppingen, 1878.

E. Klebs, *Prager Vierteljahrschrift für praktische Heilkunde*, Case 8, 1877, vol. cxxxiii.

Th. Zacher, *Archiv für Psychiatrie*, 1888, vol. xix.

Cases of Distension of Lateral Ventricle by Hydatid Cysts

Worcester Asylum Report, Review, *Journal of Mental Science*, July 1872.

George P. Rugg, *British Medical Journal*, 1st August, 1874.

F. Stocks, *Ibidem*, 24th January, 1874.

Frederic Flint, *Lancet*, 9th April, 1881.

Cases of Tumours in Lateral Ventricle, etc., with Œdema of Surrounding Brain Substance.

Alfred H. Martin, *British Medical Journal*, 9th Jan., 1875.

W. B. Ransome, *Brain*, 1895, vol. xviii.

J. P. Falret, *Bulletins de la Société Anatomique de Paris*, 1866, vol. xli.

N. Friedreich, *Intracranial Tumours*, Würzburg, 1853.

M. Rosenthal, *Medizinische Jahrbücher der K. K. Gesellschaft der Aerzte*, Vienna, 1882.

A. Holländer, *Jahrbücher der Psychiatrie*, vol. iii.

F. K. Stahl, six cases, *Allg. Zeitschrift für Psychiatrie*, 1869–73.

C. Fürstner, *Archiv für Psychiatrie*, 1875, vol. vi.

Gottfried Jehn, Cases 1, 2, and 4, *Ibidem*, 1878, vol. viii.

10. Violent Mania Subsequent to Ear Disease

Another proof of the correctness of my theory that the middle part of the cortex of the temporo-sphenoidal lobe is connected with the emotion of irascibility, leading when morbid to violent mania, is the observation

that disease of the internal ear, when it extends through the thin partition of bone to the membranes or brain in immediate contact with it, may set up symptoms of mania furiosa of varying degrees. Sometimes the cause of the disease is mere pressure. Thus cases have been observed in which a violent attack of mania ensued on cessation of a purulent discharge from the ear, and ceased on the return of the discharge. Griesinger, Jacobi, Koerner, Huguenin, Morel, Paul Robin, Bennett (Dublin), and MacEwen, besides those whose cases will be quoted, have observed the above facts and commented upon them.

An important medico-legal case.— William Freeman, a servant, was the son of a slave. Several members of his family were insane. At the age of 16 he was sentenced to five years' imprisonment for stealing a horse. It was the general opinion that he was innocent of the charge. Whilst in prison, Freeman was struck a severe blow over the side of the head, which caused a chronic purulent discharge from the ear and deafness. The unjust imprisonment seemed constantly to prey on his mind, and when he left the prison at the expiration of his sentence he sought compensation, but in vain. Remuneration with him was the one idea. He enjoyed three years' liberty. During this time he is reported never to have spoken much and to have spoken only when addressed ; never to have asked any questions ; and to have answered very briefly those put to him. He was now 22 years of age. One evening he armed himself with a common butcher's knife and left his lodging, no one knowing for what purpose. After examining two or three premises he finally selected the premises of Mr. Van Nest as the proper place to begin "his work," as he termed it, and there

massacred Mr. Van Nest, his wife, one child, aged two years, and Mrs. Wyckoff, aged 70. He stabbed another man, Mr. Van Arsdale, in the chest, who subsequently recovered. In the affray he entered every room in the house, both above and below, but took nothing away. He went to the stable, unfastened and mounted a horse, and was some rods from the scene of devastation in the incredibly short period of not more than five minutes from the time of entering the house, as was proved in evidence. Three days afterwards he was committed to jail to await his trial. The excitement caused by the killing of a well-known family, the character of the act, the plea of insanity which was made in defence, the protracted trial, the reputation of the distinguished counsel (Van Buren), and the number and standing of the medical witnesses called, all conspired to give the case an unusual interest. He died of phthisis while under trial.

The post-mortem examination revealed a very thin skull, especially for a negro, caries of the inner part of the petrous portion of the left temporal bone. The dura mater covering this portion of the skull was red and congested, and the internal structure of the ear was mostly obliterated. There was also a collection of fœtid pus in the cavity of the bone having no connection with the external ear. These changes, it was proved, were consequent upon the injury Freeman received when an inmate of the State prison; he was struck on the head with a board, the blow splitting the weapon into fragments. The medical opinion was that this injury was the cause of the diseased condition of the brain and of the violent and sudden derangement for which the defendant was on trial.—(*The American Journal of Insanity*, October, 1848, vol. v., p. 34.)

Heinrich Spitta—*A medico-legal case.*—A nursery-maid, only 13 years old, had an abscess in the brain at the age of 8 in connection with otorrhœa. The discharge continued from the ear ever after. One day, in order to be freed from service, as she said, and be allowed to return home, she ill-treated the child in her charge by repeatedly knocking its head against the stone floor of the kitchen.—(*Praktische Beiträge zur gerichtsärztlichen Psychologie*, 1855.)

Eugene Grissom—*Another medico-legal case.*—A romantic murder by a deaf-mute. The otitis commenced after scarlet fever and continued ever after. It got aggravated through a fall on the head; after which patient complained of pain in the head and fear of going wrong mentally. He was engaged to be married to the matron of the Deaf and Dumb Institution; they went for a drive together; there was perfect harmony between them; she never returned, but her body was found. She was shot through the head. The murderer escaped.—(*American Journal of Insanity*, Oct., 1887, vol. xliv.)

M. Bouchut—*On insanity in a boy, subsequent to ear disease.*—The wife of an English naval officer brought to him her boy, aged 6 years. The boy, when 3 years old, had measles and chronic bronchitis. Two years later he was sent to Nice for cure. He there had scarlet fever, and after recovery otorrhœa of the left side, which had lasted for three months. Since this otorrhœa he heard indistinctly with that ear, suffered with his head, and had nervous crises, several in a day and even during the night. No vertigo nor loss of consciousness, no vomiting. He got wild, yelled furiously, and threw himself on his mother, kicking her, and striking her with his fists. His attacks were made as if he meant to kill her. He smashed everything he could lay his hands on. After that he became calm again, began to cry, embraced his mother, until the next storm broke out shortly afterwards, with exactly the same symptoms. The noise he made was so great that the hotel people would not allow his mother to stay any longer, and she had to seek apartments elsewhere. She was recommended to reside with a medical man, and during residence there the same violent scenes occurred as before. Some chloral hydrate and morphium

injections seemed to bring about an improvement, but as the lady returned to England no further account of the patient could be given.—(*Gazette des Hôpitaux*, 30th Oct., 1877, Case 1.)

The same Author—*Similar case, with recovery.*—A child, 6 years old, alarmed its parents considerably by its frequent attacks of delirium, presenting all the characters of madness. Not recognising its parents, it would endeavour to strike and beat them, it would break up all the furniture in the place and run its head against the walls, thinking them living beings, all the time shouting noisily. The attack commenced with only very slight rise of temperature, but would last several hours, and occurred at night as well as during the day. The attack being over, the child would grow calm, recognise those around him, and be none the worse but for a slight headache. There was no sign of epilepsy or meningitis, or any other nervous symptom besides those mentioned. On questioning the parents, it was ascertained that the child had had a discharge from the right ear. On examination, the parts around the ear, particularly along the sensory nerves, were very tender. An injection of two milligrammes of morphia morning and evening seemed to benefit the child, and in a few days the attacks ceased and did not again recur.—(*Ibidem*, Case 2.)

Ludwig Meyer—*Treatment of otorrhœa followed by mental recovery.*—Carl T., aged 43, changed in character about two years previous to his admission. Always of cheerful temper, amiable toward his family, peace-loving and sociable, he grew irascible, kept in ill-humour for days together, was often violent without cause to those about him. On admission he was violent and even dangerous if his wishes were not gratified

forthwith. The strait jacket had to be applied to him frequently. A few days after admission a putrid discharge from the ear was noticed, and simultaneously his mania furiosa ceased. Two months later the discharge stopped and then his fury recommenced, so that he had to be isolated. In three days' time the discharge reappeared, and upon its appearance the mental excitement diminished and ultimately gave way. This repeated itself so often that the attendants began to regard the otorrhœa as a barometer of the mental state of the patient. One day, however, the discharge ceased without any signs of mental excitement, but it was observed that the pus had made its way to the mastoid cells, where a tumour could now be seen. On incision and subsequent proper treatment patient was cured of his ear-trouble, and with it of his mental derangement.—(*Deutsche Klinik*, 1855, vol. vii.)

G. Burckhardt.—*Homicidal Tendencies—Operation—Apparent Recovery.*—B. B., widow, 37 years old, had hallucinations of hearing, apparently in both ears, with impulses to kill her sister and child. Herself asked for admission. A portion of the brain weighing 3 grammes was removed from the posterior part of the first and the middle of the second temporo-sphenoidal convolutions on the left side. The substance of the brain was found to be unusually soft. Sensory aphasia after the operation, but fewer hallucinations. Another operation was contemplated, but the friends of the patient took her away. Her quarrelsome tendencies and impulses to kill seemed to have disappeared, and she was delighted to be with her child again. She was unexpectedly found drowned one day; she probably committed suicide, though she had not exhibited the slightest sign of discontent or of mental disturbance. —(*Zeitschrift für Psychiatrie*, 1891, vol. xlvii. Case 3.)

Dr. Koeppe.—*Impulses to Violence—Recovery.*—Hoffmann, bricklayer, sustained in his 49th year several injuries to his left ear, which made it bleed, and affected his hearing. Noises in the ear; pain worse on standing in a draught. Gradually he got irascible, quarrelled much with his wife and children, with whom he had lived on happy terms previously, and often there were violent scenes, ending by his beating his wife. He stated that he could not help it when he got into a rage. Left half of his head was hyperæsthetic. There was diminished hearing in the left ear; plugs were found in it. On their removal there was still

some difficulty of hearing, but mentally he recovered completely. —(*Archiv für Ohrenheilkunde*, Leipsic, 1875, Case 2.)

W. Rhys Williams.—*Violent Mania associated with an Abscess connected with the Ear—Cured by Opening the Abscess.* (*From notes supplied by Dr. Savage.*)—Charles D. C., 26, married. No insane relatives. Had enjoyed good health. Industrious and sober. Thirteen days before admission he became rambling in his talk. In a few days he grew excited, noisy, violent, and incoherent. He was continually swearing and screaming out violent language. Said he saw devils. On admission he was violent and boisterous, but on appearance of a purulent discharge from the left ear he became quieter and not so noisy, but still under a delusion, fancying the attendants wanted to do him harm. When the abscess was opened he became sane at once.—(*Lancet*, 28th April, 1877.)

Dr. Homer.—A labourer, aged 27, had defective sight for six weeks, with pain in left ear, severe otorrhœa, and deafness, and was for a few days aphasic. On recovery of speech mental disturbances set in, with a grinding of the teeth. Patient roared and behaved like a wild animal. There was paralysis of the left facial nerve.

The autopsy revealed necrosis of the petrous bone with meningitis around, involving the auditory and facial nerves at the internal auditory meatus.—(*Monatsblätter für Augenheilkunde*, August, 1863, Case 26.)

Dr. Homer was struck by the frequency with which ear-affection, when complicated with meningitis, is accompanied by excitability and irascibility.

Other cases of violent mania subsequent to ear disease are the following:

Heinrich Schüle, *Handbuch der Geisteskrankheiten*, Leipsic, 1878, p. 296.

Geo. C. Bablett, Cases 3 and 4, *American Journal of Insanity*, July, 1877, vol. xxxiv.

Dr. Jansen, *Berliner klinische Wochenschrift*, 30th November, 1891.

Ludwig Schlager, Case 6, *Zeitschrift der Gesellschaft der Aerzte zu Wien*, 1857, vol. xiii.

Report of the Vienna Asylum for the Insane, 1858, p. 47.

Sir Wm. MacCormac, *Lancet*, 1886, vol. ii. p. 211.

Journal of Mental and Nervous Disease, New York, 1898, vol. xxv., p. 609.

Timot. Riboli, *Fil. Seb.*, April, 1848.

Guglielmo Fabri, *Italia Medica*, 1883, No. 10.

Henry Kucharzewski, *Le Progrès Médical*, 1894, No. 29.

A. Babinsky, *Languedoc Médical*, 15th November, 1891.

The first two recovered mentally on the ear-disease getting well.

By these cases one is forcibly taught the lesson that an apparently slight and unimportant ailment such as a running from the ear, which is apt to be looked upon rather as an inconvenience than a disease, may prove very dangerous.

11. Irascibility and Violent Mania, Accompanied by Word-Deafness

Dr. Bancroft.—The case was that of a man suffering from sub-acute mania and angry excitement, so that he could not get on with his family and friends, and since they would not treat him at home he was brought to the asylum. Dr. Brancroft's own words are : "There was in his mental aberration, considered in itself, nothing uncommon. The peculiar symptoms in the case were a disturbance in the power of language, not in the formation or use of words, but in the power to communicate with other persons. His particular symptom was inability to appreciate, through the sense of hearing, any words spoken to him. He was with us nearly two years, and during all this time there were but one or two instances in which it seemed that he really heard what was said to him and appreciated it, but it was never clearly proved. It appears that the sense of hearing was perfect. Any sound occurring in the immediate neighbourhood he could evidently hear, but any word addressed to him was never responded to, and there is no evidence that he ever understood it."—(*American Journal of Insanity*, October, 1879, vol. xxxvi., p. 196.)

Watson Cheyne.—The patient was a male, aged 26, a coal porter, who had suffered from a chronic suppurative discharge from the left ear for seven or eight years. The patient had been a healthy man, temperate in his habits and in constant employment. The ear-trouble he attributed to the fact that when at work he always wore a leather arrangement on his head, the buckle of which pressed on and hurt his left ear. He had on two previous occasions had severe attacks of pain in the left temporal region. On the present occasion the pain began four days before admission into the hospital, in the left temporal region, apparently without any definite cause. Five days after the outset of the pain he became delirious at night, and during the day was very noisy. Patient was trephined an inch and a quarter behind the centre of the auditory meatus, and some distance above the base line. An abscess was found half an inch further inwards and forwards, and was evacuated. Patient's restlessness and noisiness continued during the next fortnight, when he became word-deaf, but a few days afterwards his condition improved.—(*British Medical Journal*, 1st February, 1890.)

W. L. Worcester.—Man, aged 78, with word deafness, restless and uneasy.

Post-mortem.—The left temporal lobe was distinctly smaller than the right, and the

first and second temporal convolutions were thin and of a yellowish colour and of leathery consistence. No other lesions.—(*American Journal of Insanity*, October, 1896, vol. iii., Case 4.)

Dr. Schäfer.—E. M., a man, 45 years of age, was accidentally injured through a wagon driving over his head. Since then there was irritability. One day he became suddenly so excited that he was brought to the asylum. Dr. Schäfer thought he observed word-deafness.

Post-mortem.—There was an abscess in left temporal lobe and hyperæmia on the under surface of left temporal lobe.—(*Centralblatt für Nervenheilkunde*, 1st February, 1881.)

M. Bernhardt gives a description of a case of Wernicke's sensory aphasia or Kussmaul's word-deafness. S., a shoemaker, 46 years old, who showed symptoms of passionate excitement.—(*Ibidem*, 1st June, 1882.)

Albert Rosenthal.—A case of an engineer, 43 years old, a general paralytic, suffering from sensory aphasia. He was discharged after a year's treatment, but came back after another two years suffering from violent maniacal excitement. He was easily aroused to anger, became dangerous and destructive. He gradually grew weaker, but held on his excitement, to which he gave expression as well as his condition would permit.

Post-mortem.—The left temporo-sphenoidal lobe, particularly the inferior convolution, was so softened that it was washed away by a jet of water.—(*Ibidem*, 15th April, 1886.)

The same Author.—F. K., aged 39, had an apoplectic stroke. Temporary hemiplegia on right side. Sensory aphasia. Agitated mental condition. Could not count up to ten. Could calculate well formerly.

Post-mortem.—Left temporal lobe, especially superior and middle temporal convolutions, atrophic.—(*Ibidem*, 15th December, 1889.)

A. Pick.—M. Anton, labourer, aged 24, married. Had an apoplectic stroke with temporary symptoms, one four years previously and the other three months ago. Since that time, however, he was in a state of excitability, in which he threatened to murder and set fire. On admission he had sensory aphasia. Died of anasarca.

Post-mortem.—Both temporal lobes and island of Reil were softened and of yellow colour. Rest of brain quite normal.—(*Archiv für Psychiatrie*, 1892, vol. xxiii.)

Ernst Bischoff.—Mrs. J. T., aged 65, after a melancholic depression, became acutely maniacal, had paroxysms of fury, was stubborn, obstinate, resisted violently if her wishes were not complied with. In the institution her one topic of conversation was her children, for whom she always longed, yet when they came to see her she did not recognise them. She had sensory aphasia and died of an apoplectic stroke.

The autopsy revealed atrophy of both temporal lobes. On the left side all temporal convolutions were reduced to a fraction of their normal size. Another lesion in the left paracentral lobule, and another, a very little one, in the left occipital lobe.—(*Ibidem*, 1899, vol. xxxii., Case 1.)

The same Author.—Mrs. W. W., 77 years old, had sensory aphasia and suffered from paroxysms of fear alternating with irascibility and excitement.

The autopsy revealed recent hæmorrhage, which destroyed part of the left island of Reil and nearly the entire lenticular nucleus. The inferior parietal lobule and posterior part of first temporal convolution were softened. On the right side the middle third of the temporal lobe was softened.—(*Ibidem*, Case 2.)

The same Author.—K. S., 35 years old, suffered for a whole year from great excitability, defects of hearing, and sensory aphasia. On admission he was so violent that he could only with difficulty be restrained. He gradually became demented, and died after a few months.

Post-mortem.—Well marked atrophy of the upper two temporal convolutions on both sides. Atrophy of the frontal lobe.—(*Ibidem*, Case 3.)

Ludwig Bruns showed to the assembly of Alienists at Hanover, 1st May, 1891, the brain of a man, a musician, which presented total softening of the first left temporal convolution. Rest of brain normal. Patient had sensory aphasia (word deafness), but his ear for music was maintained. Mentally he was very irascible—so much so that towards the end of his illness he had to be removed from the hospital to the asylum. —(*Allg. Zeitschrift für Psychiatrie*, 1892, vol. xlviii.)

Otto Hebold.—Wilhelm L. ill-treated his children, made an attempt to kill one. On admission : sensory aphasia.

Post-mortem.—The whole left temporal lobe was disorganised through softening. —(*Ibidem*, 1894, vol. l., Case 1.)

Leop. Lacquer contributes a case of sensory aphasia with softening in the first temporal lobe and adjoining parts, and notes the irritability of the patient as one of the symptoms. He was easily roused to anger, and always in ill-humour.—(*Neurologisches Centralblatt*, 15th June, 1888.)

J. Fritsch.—A lady, 80 years of age, known all her life as bad-tempered, got suddenly excited one night, threw her bed-clothes about with angry gestures, and spoke unintelligibly. On admission it was noticed that she did not understand what was spoken to her ; she substituted words at times.

She died in collapse three months after admission, and was found, post mortem, to have softening of the posterior half of the first and second temporal convolutions, and an embolus in the sphenoidal branch of the left arteria fossæ Sylviæ.—(*Wiener medizinische Presse*, 1879, p. 463.)

L. Bianchi.—Cerbone J., aged 61, was a working man given to drinking and sexual excesses. His intelligence was of low type, and his life history bears the imprint of predominance of the baser instincts, and generally, when he had raised his elbow too often, he became violent and quarrelsome. One morning he showed signs of aphasia ; he did not understand a single question, though he could hear the slightest sound, and would turn immediately in the direction whence the sound came. He spoke seldom, and then generally disconnectedly, so that it was impossible to understand him.

Post-mortem.—The upper half of the temporal lobe was softened.—(*La Eimplegia*, Naples, Case 6.)

Giuseppe Seppilli.—A widow, aged 51, entered the hospital in a state of violent mania. She suffered from word deafness, though her hearing was perfect. Her mental faculties after the subsidence of the delusion seemed unimpaired.

Necropsy.—The membranes were adherent over the first and part of the second convolution of the left temporal lobe.—*Rivista sperimentali di Freniatria*, 1884, vol. x.)

F. Baizer.—A large patch of softening occupied the first and second temporal convolutions, and also the lower part of the inferior parietal lobe. Day and night the patient was in a state of incessant agitation. —(*Gazette médicale de Paris*, 1884, vol. ix., p. 97.)

A case observed in the clinic of **Prof. Kussmaul.**—*Against "Sensory Aphasia."*—A woman of 63, admitted with furunculus of the face, died of bleeding into the intestines. On examination there were found wanting about one half of the left temporal lobe, the anterior part of the 1st and 2nd, and the whole of the 3rd temporal convolutions. The patient could hear quite well, read and speak quite fluently. Her mental condition appeared quite normal, save that for the last two years her character had changed ; she had become selfish and quarrelsome.—(*Berliner klinische Wochenschrift*, 1885, No. 17.)

12. Epilepsy and Violent Mania (Epileptic Insanity)

Inflammatory lesions of the temporal lobe may lead not only to symptoms of irascibility and violent mania, but to convulsive fits, owing, presumably, to the proximity of some basal structures—the cornu ammonis—the excitation of which gives rise to convulsions. Similarly, lesion of these basal structures may lead to excitation of the temporal lobes, and hence the fits be preceded or followed by maniacal outbursts. The evidence for sclerosis of the cornu ammonis in epilepsy is so numerous that it need not be quoted here, but at the end of this chapter will be found appended a number of cases in which it was distinctly stated that the patient suffered not only from epilepsy, but from excessive irritability, some patients being violent, and having paroxysms of furious mania. Wundt regards the atrophy and hardening of the hippocampus in

epileptics as dependent upon the asymmetrical enlargement of the lateral ventricle. This he regards as the result of the disturbance of the circulation which accompanies all epileptic fits. The left cornu ammonis is more often atrophied than the right.

Sometimes an epileptic fit may be replaced by a paroxysm of acute mania, which fact shows the intimate relation between the two, the convulsive and the maniacal attack. Both are paroxysmal and explosive, violent and sudden. The change of disposition in the epileptic is remarkably characteristic. From this change alone an experienced observer will frequently be led to infer the presence of epilepsy. There are present extreme irritability, a combative tendency, undue suspicion, violent outbreaks of temper, and frequently strong homicidal tendencies. Post-epileptic violence is impulsive; it precludes the existence of animosity or premeditation; there is generally an entire absence of motive or cause of quarrel. Yellowlees says: "If a man has epilepsy, a tendency to violence is one of the normal manifestations of his disease, whether he has shown former insanity or not. As a rule, epileptic violences are abrupt, sudden, reckless, and not planned."

That this mental state is due to their disease and not to any predisposition to violence is shown by the fact that so many epileptics, in the intervals between their fits, find genuine consolation in religious devotion, that they are ever hopeful, and fully appreciative when sympathy is shown them in their suffering.

David Skae.—"Hardly an epileptic who does not take great care of his Bible. Ecstatic visions not uncommon."

That genuine epilepsy is a basal disease, and not an affection of the so-called motor area (Jacksonian

epilepsy excepted), is shown by the fact that out of ten epileptics whom Alder Blumer trepanned over the motor regions, neither the mental condition nor the number and severity of the fits improved.

Theodor Meynert found that in epilepsy the greatest atrophy and loss of weight is in the temporal lobes, and the following cases[1] will demonstrate the frequency of their lesion in epileptic mania :

Dr. Stuckle—*A Swiss picture of the time.*—J. D., an epileptic, married, father of three children, was much ill-treated in his youth by his father, who was of a violent temper. He often lost consciousness after severe chastisement. Patient studied well, was good-natured, sociable, industrious, and economical. Epileptiform convulsions commenced in his 20th year, and simultaneously with them his character changed. He became less sociable, irascible, and inasmuch as business brought him into public houses, his irascibility was thought to be due to drink. When 26 years old he had an attack of mania furiosa, lasting several days, during which he was chained down. Venesection seemed to quiet him for the time, but the attacks recurred every three or four weeks. A private physician who took charge of him seemed to have cured him with some purgatives, and sent him home with a certificate of health. He married shortly after this cure. The year after, the attacks of rage recurred and grew more frequent. They were accompanied by oaths and threats against his nearest relatives. He was frequently tied to a chain. In his lucid intervals he was very religious. Two years after marriage, now in his 29th year, he locked a woman, whom he em-

[1] In addition to those quoted on page 128 (twelve cases of injury) and page 142 (eleven cases of tumpurs).

ployed in business, in his room, where a prayer-book and some butcher's knives were lying on the table, and told her that she would have to suffer with her life for her want of piety, and that he was destined to kill her. Her cries for help saved her life, but she lost an eye in the adventure. The raging maniac was handcuffed and locked up. The following year he was again sent to a private asylum for his repeated attacks of furor, and was once more discharged as normal. Immediately on his arrival home he threatened his brother-in-law, was again arrested and again sent to a private asylum, where the lady-superintendent and proprietress attempted to cure him by exceptional kindness and attention, until he caused her bodily injury and was handed over to the police. Three years after we find him in another private asylum, where he caused more damage and injury to patients. One more private asylum took charge of him. Here they thought his maniacal attacks due to tapeworm, and discharged him when they succeeded in freeing him from his ascarides. His epileptic attacks now grew very frequent. He ended his days in the State Asylum in his 36th year.

Post-mortem.—The lateral ventricles were very much dilated, chalky deposits and osteophytes in the middle fossa of the skull.—(*Allg. Zeitschrift für Psychiatrie*, 1856, vol. xiii.)

Fr. Meschede—*A case of pyromania.*—Natalie X., an epileptic girl, 17 years of age. She showed a tendency to mischief a year before her admission. She stuck a knife into the lungs of her father's horse; another time she cut up a perfectly new dress, and another time unchained a dog known for his viciousness. She frequently laid fire, and on each occasion said she could not resist the impulse: she felt she had to do it. She learnt well at school, but had to be removed

because of her interrupting the lessons. Her father thought her a wicked child and punished her, but she did not appear to feel the chastisement. An aunt of hers in another town took charge of her, until she was caught one night attempting to pierce the eyes of the children with a hairpin. After the injury was done she confessed that an inner voice prompted her to do so. She made several more attempts to set on fire. Several experts had examined her, and advised her being consigned to an asylum. At the institution she had a mania for taking hold of burning objects, and collected all the matches. During the Christmas festivities, when supervision was somewhat relaxed, for precaution's sake her bed was examined, and a collection of matches was found in it. Even when she was free from fits she was very noisy and aggressive, beating, kicking, and scratching other patients. She kicked a can of oil over, tore numerous dresses, and, notwithstanding the supervision, succeeded in hiding objects with which she could lay fire. She had otorrhœa dextra, which increased latterly very much. She died of miliary tuberculosis. Altogether she succeeded in causing fires six times.

The autopsy revealed a very prominent osteophyte in the form of a crest immediately behind the sella turcica. The arachnoidea was turbid and remarkably thick at the temporal lobes. The brain substance felt firm and hard.—(*Alleg. Zeitschrift für Psychiatrie*, 1873, vol. xxix., Case 1.)

The same Author.—Martin Kluszikowski, an epileptic, 18 years of age, who with perfect calm, apart from motive or cause, loved to injure people. He had the mien of a cat: the noiseless, elastic tread and treacherous glance, but otherwise he seemed harmless. His derangement showed itself mainly in impulses of harmful mischief and in attempts to cause personal injury. Such aggressive paroxysms differed from those of epileptics, inasmuch as they were not accompanied or preceded by feelings of rage or anger; not done blindly or noisily—they were committed slyly as if in gratification of some morbid impulse or desire. His acts also had not the character of being done spontaneously, and he appeared conscious that he was doing wrong. The cat-like seizure of oppor-

tunities where he could do wrong made him highly dangerous. Thus: a workman was putting down a file for a moment, which the patient promptly seized, and stabbed another patient with it in the back. He bit another patient's fingers.

The autopsy revealed meningitis limited to the basis of the brain, particularly to the middle fossæ. All the membranes were adherent in this region, both to the skull and brain, and the brain substance was found sclerotic, particularly the cornu ammonis.—(*Ibidem*, Case 2.)

Otto Snell.—An epileptic, 44 years old, with paroxysms of violent mania, showed post-mortem caries on the left petrous bone, with softening of the surrounding brain substance.—(*Ibidem*, 1875, vol. xxxii.)

F. Lührmann.—K. H. M., 25½ years old, had a convulsive fit and suffered for ten days after with furious mania. His fits resembled hysterical attacks. After a lucid interval he was discharged, but had to be re-admitted after a week with symptoms of organic lesion. There was persistent headache in the left temporal region, and he was somewhat aphasic, and of bad temper. He had another lucid interval in which he stated to have had hallucinations of some one murdering him. He was discharged anew.—(*Ibidem*, 1896.)

Ludwig Meyer.—Heinrich S., joiner, 36 years old, married, fell into the street from a window he was repairing. He seemed uninjured except for a superficial contusion, but from the right ear flowed a light fluid, and on recovery from the shock there was impairment of hearing. Later on, also, he heard with the left ear with difficulty. Some weeks later he had general convulsions. His character changed and he was easily roused to violence, attacking his wife and friends, and destroying the contents of a room. At the institution he so often attacked his fellow patients that he had frequently to be isolated. He had an apoplectic stroke and died four years after the accident.

Post-mortem.—There were several large and sharp exostoses in the right middle fossa with localised pachymeningitis.—(*Archiv für Psychiatrie*, 1872, vol. iii., Case 39.)

Sir Samuel Wilks.—Case 48, a man, aged 31, epileptic, maniacal.

Post-mortem.—The membranes at inferior surface of right temporo-sphenoidal lobe were closely adherent.—(*Guy's Hospital Reports*, 1866, vol. xii.)

Dr. Kelp.—A. G., sailmaker, 38 years old, admitted first for melancholia, which, however, disappeared rapidly, and he was discharged. Three months after he was re-admitted for acute mania. His two morbid impulses were to hoard and to destroy. He filled his pockets with useless articles, such as pebbles, and took anything he could lay his hands on—towels, brushes, etc. He destroyed whatever came in his way, destroyed all locks, and even the crossbars of the windows, not to speak of the bed-clothing. His mania increased, especially when spoken to about his acts, and he occasionally attacked the other patients. But when not excited he made himself useful and worked diligently. Two years later epileptiform convulsions set in and continued for some time. An increasing tremor of the upper extremities and contractures of the lower, a scanning speech, and other signs pointed to multiple sclerosis.

Though now helpless he continued to be quarrelsome. Labioglosso-pharyngeal paralysis followed, and he died four years after his first admission.

Post-mortem.—The brain was anæmic, dry, difficult to cut. In the right temporo-sphenoidal lobe, close to the cortex, was a lesion, size of an almond, which bore the signs of having been the seat of hæmorrhage.—(*Deutsches Archiv für klinische Medizin*, 1872, vol. x.)

Sir Frederic Bateman.—Mr. C. G., a gentleman, aged 36, subject for many years to great mental excitement, which increased four months after his marriage so much that it became necessary to place him in an asylum. Some months later he was attacked with convulsions, followed by right hemiplegia, with total loss of speech, and he died in a few days.

Post-mortem.—The anterior convolutions were especially examined, and found quite healthy. The most remarkable appearance that this examination disclosed was a deposit of rough bony matter—exostosis, at the centre of the fossa corresponding to the middle lobe of the brain on the left side, and to this rough surface the cerebral membranes were slightly adherent. No disease of central ganglia.—(*On "Aphasia,"* London, Case 4.)

A. Nellis reports a case of atrophy with subsequent cystic degeneration of inferior and middle frontal convolutions and posterior third of temporo-sphenoidal lobe. The patient, J. H., an idiot, 17 years old when admitted, was sent to the asylum from an almshouse where he had been kept for several years. He was stated to have had daily convulsions for some years, but not to be destructive or to have any disposition to injure any one. At the asylum he was found to be extremely idiotic, was never seen to have convulsions for the seventeen years of his residence, but he had frequent paroxysms, when he became noisy, excited, and violent, and from sudden impulse and without provocation assaulted his associates. He was dull and could not speak. He moved about very little, unless excited, when he was noisy day and night, and assaulted every one who approached him.—(*American Journal of Insanity*, October, 1887, vol. xliv.)

A. Cullerre relates a case of a man of 36, one of the most violent and dangerous epileptics under his care, who died in acute delirium, and whose skull at the base was very asymmetrical, and in whom the left cornu ammonis was found necrosed.—(*Annales Médico-psychologiques*, 1890, 7th series, vol. xi.)

M. Foville.—Patient, a man, 36 years old, who died of acute maniacal delirium which lasted twelve days, had the meninges cloudy and adherent to the frontal and temporal lobes. On reflecting them the brain substance adhered to them.—(*Ibidem*, March, 1882.)

S. W. D. Williams.—F. P., single female, aged 27, a common prostitute, first admitted into Brighton Workhouse suffering from delirium tremens and syphilis. When the more violent delirium subsided she became hypochondriacal and was admitted into Sussex Lunatic Asylum. Severe pain in the head, especially at the left temple, drumming in the ears, and at times deafness. A gradual change in her mental disposition: instead of being hypochondriacal she became noisy and restless,

extremely spiteful and very mischievous. Filthy habits all along. She ate with avidity all that was given her, though she brought up nearly all she took. Epileptiform convulsions set in, and she died fifteen months after admission.

Post-mortem examination.—On attempting to remove the brain from the skull it was found impossible to do so, owing to the middle lobe being bound down with three membranes, in one solid mass, to the bone. On applying a little force with the finger in this spot it broke through into a cyst from which a quantity of thick greenish pus escaped. The most characteristic syphilitic lesion was found on the temporal lobe close to the Sylvian fissure, opposite the Island of Reil. There was also a small patch of softening in the left lobe of the cerebellum on its lower surface.—(*Journal of Mental Science*, April, 1869, vol. xv.)

T. S. Clouston.—T. M., 38 years old ; on admission, obstinately silent, six months after sévere epileptic fits. He then got into the state in which he remained for the ten years he lived, viz., a slightly weak-minded but coherent, intensely irritable man, who would strike out at any one on the slightest provocation or contradiction. He was most irritable after the fits. If he did not strike the man who refused him a request, he abused him in the foulest and most vituperative language.

Post-mortem appearances.—The inner part of the skull-cap, in a circular space, three inches in circumference, behind and above the internal ear, was rough and eroded looking. The dura mater lying under this was very rough on its outer surface, had many fine spiculæ of bone projecting from it, and was thickened in the centre of the patch to a quarter of an inch on section. A similar thickened spot in the dura was found in nearly the same situation in the left temporal lobe. Besides the under-parts of both anterior lobes, the lower parts of the temporo-sphenoidal lobes had undergone atrophy.—(*Ibidem*, October, 1875, vol. xxi.)

The same Author.—D. G., aged 30, engineer, five years an epileptic, after a fall on the left side of the head in a ship. He had been very dangerous, and suddenly violent to those near him. Stupid and confused in mind after the fits. In the asylum he was very irritable and violent in an impulsive way.

Post-mortem examination.—In the squamous portion of the temporal bone there was an irregular excrescence of bone projecting upward, and closely adherent to this the dura mater, arachnoid, pia mater, and brain, all being matted together by rough fibrous tissue all round this part to the extent of three quarters of an inch in circumference. Two or three of the temporal convolutions were atrophied and softened, and of a dirty grey colour. On section of the brain it was found that the softening extended inward as far as the left ventricle.—(*Ibidem*, Case 2.)

T. B. Worthington.—Charles G., suffering from epilepsy and extreme irritability of temper.

Post-mortem.—The chief lesions were a patch of softening on the left temporo-sphenoidal convolution. The left lateral ventricle was completely filled with clotted blood and broken-down brain structure, weighing $3\frac{1}{2}$ ozs. The right was distended with blood-streaked serum.—(*Ibidem*, July, 1880, vol. xxvi.)

W. R. Wood.—S. B. G., aged 61, an artist, in a restless and very irritable condition with epileptiform fits and frequent grinding of teeth.

Necropsy.—The temporal bones on both sides were porous and brittle.—(*Ibidem*, July, 1884, vol. xxx.)

Frank Hay.—S. B. K., male, single, aged 39, first suffered from depression. Then he had an epileptic attack, became maniacal, and had to be removed. He was certified to be in a state of extreme excitement, with outbursts of violence. On admission he was easily provoked. He was aphasic. He could not give expression to principal words, though he could to subordinate ones. He spoke correctly when under excitement. Before his epileptic attacks he became gloomy and morose ; after them he was roaring, interjecting oaths, his expression became threatening, and he seemed to have auditory hallucinations.

Post-mortem.—There was slight atrophy in the frontal and parietal regions. At the anterior part of the three temporo-sphenoidal convolutions the cortex was entirely disorganised. When held under a stream of water the cerebral tissue was washed away, leaving a cavity which entered the fissure of Sylvius, and partly exposed the insula and anterior extremity of the operculum. The lateral ventricles were dilated. —(*Ibidem*, April, 1895, vol. xli.)

A. Tamburini.—Paul Veronesi, a beggar, 45 years of age, hemiplegic on left side from infantile paralysis, and subject to epileptic attacks from childhood ; had paroxysms of fury. In one of these he killed an inmate of the institution. He was very obedient, quiet, and industrious. On the approach of his fits, and sometimes without the occurrence of these, he became obstinate, quarrelsome, destructive, and violent, particularly against children. Speech was defective. The range of his illness limited, memory poor, the feelings scanty, but the propensities strongly developed. He complained of ear trouble only just before his death, which occurred five years after admission.

Post-mortem.—There was an exudation of pus beneath the arachnoidea in the right fossa Sylvia which was completely filled with it, and had destroyed the entire island of Reil. The base of the right temporal lobe was completely covered with pus. On the inner side of the temporal lobe, towards and including the cornu ammonis, the brain-substance was sclerosed, and creaked under the knife.—(*Rivista Sperimentale di Freniatria*, vol. v.)

Bourneville and d'Olier.—Charles Pass, when four years old, changed in character, which became very irascible and bad. When six years of age he became epileptic. On admission his paroxysms of violent anger were most noticeable.

The autopsy revealed asymmetry of the base of the skull and exostoses of the left temporal bone in the middle fossa. In this situation the pia mater was injected, and there was a large cyst communicating with the posterior half of the lateral ventricle. (*Recherches sur l'Epilepsie*, Paris, 1881, p. 62.)

The same Authors.—A man, 41 years of age, an epileptic for fifteen years, was violently maniacal after the fits. His face and head were asymmetrical, and gave him a brutal appearance.

Post-mortem.—The pia mater was congested and adherent to the brain substance at the base of the left temporal lobe.—(*Ibidem.*)

Sclerosis of cornu ammonis in epileptics who manifested excessive irritability, some being subject to violence and paroxysms of furious mania:

Krankenverzeichniss der Allenberger Irrenanstalt, Cases 1937, 2023, and 2403.

Bericht über die niederoesterr Irrenanstalt, Ybbs, 1872, Cases 11 and 19.

Allg. Zeitschrift für Psychiatrie:

Feith, 1867, pia adherent to temporal lobe.

Otto Snell, 1875, two cases.

Henker, 1877, four cases.

Zohreb, 1886, three cases with softening of temporal lobe.

Vierteljahrschrift für Psychiatrie:

Theodor Meynert, 1867, Cases 2 and 11.

C. Bouchet, De l'Epilepsie, 1825, Cases, 10, 13, and 15, with softening of temporal lobe.

Annales Médico-psychologiques:

C. Bouchet, 1853, Cases, 24, 26, 27, and 29.

Parchappe, Traité de la Folie, 1841, Case 271.

13. Post-Apoplectic Insanity

It is a well-known fact that there are some insane patients whose mental disturbance dates from the time of an apoplectic stroke. Considering the proximity of the temporo-sphenoidal lobe to the corpus striatum, in which most of the hæmorrhages take place, we are not surprised that such patients, even when not insane, get excited, irritable, and quarrelsome. They are rarely seen in an asylum, for they hardly ever become so excited as to be dangerous; and, secondly, because the accompanying hemiplegia prevents them from becoming violent. Neurologists, on the other hand, study more the derangements of the motor and sensory functions, and would take but little if any notice of the mental changes.

J. Luys found that in hemiplegics, whose temper is easily irritated, the superior temporal convolution was involved.—(*L'Encéphale,* September, 1881, p. 378.)

Albert Rosenthal has described cases of patients with hemiplegia who manifested agitation and bad temper, and in whom the temporal convolutions showed lesions post-mortem.—(*Centralblatt für Nervenheilkunde,* 1st January, 1884, and 1st December, 1889.)

The **Annales Médico-psychologiques** give the case of a young man, aged 27, who had an apoplectic stroke when twenty-four years old, and

was permanently paralysed on the left side of his body. He made an attempt to kill his father.—(*Annales Médico-psychologiques*, 1865, p. 173.)

H. Schüle.—A. Weidenhiller, 30 years old; after an apoplectic stroke, furious mania of the highest degree set in with brutal violence. Fibrillar twitchings round mouth. Two focal softenings, one outside the right claustrum, and another at the base of the two ascending convolutions. —(*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874.)

14. Experimental Evidence

Darwin's and Herbert Spencer's description of the physical expression of the "irascible" emotion in animals, as, for instance, when about to attack an antagonist, is: a drawing back of the ears, gnashing of the teeth, and growling; while Dr. Ferrier observed that the excitation of the temporo-sphenoidal convolutions in monkeys and the corresponding convolutions in dogs caused retraction of the ear, accompanied occasionally by a sudden spring or bound forward; and, in cats, it caused opening of the mouth, associated with vocalisation and other signs of emotional expression, such as spitting and lashing the tail as if in rage. This area is no other than that which Gall found so prominently developed in all carnivorous animals, and in murderers, and which he supposed to be the physical condition of the destructive propensity or irascible emotion. Whatever may be said against his deduction, the facts which he observed nearly a century ago agree with Meynert's observations (a comparison between the brains of carnivorous and herbivorous animals) and with those of Benedikt (a comparison between the brains of murderers and carnivorous animals).

15. Conclusions

From the foregoing 350 clinical records it would appear that in lesions of the middle part of the temporo-sphenoidal lobe "irascibility" is a prominent

symptom, and that such lesion may lead to "violent and destructive mania," and even to "homicidal mania."

1. This is shown by numerous cases of injury, such as blows to this region, falls, shots, boxes on the ear, etc., a great many of them having recovered after operation.

2. It is shown by tumours, inflammatory lesions, hæmorrhage, etc., giving rise to the same symptoms.

3. Also by abnormal development of this brain-area having a similar effect.

4. It is shown that, whereas motor-aphasia is rare in melancholia, and when it occurs, expressions of lamentation are still possible, motor-aphasia frequently takes place with maniacal excitement, though swearing may still be possible.

5. It is shown that genuine epilepsy is apparently due to a basal lesion in close proximity to this brain-area, hence violent mania frequently precedes, replaces, or follows the fit of convulsions.

6. In favour of the localisation of the emotion of irascibility in the middle part of the temporo-sphenoidal lobe, that is, the cortex adjacent to the ear, is the fact that ear-disease is frequently followed by irascibility and even furious mania.

7. Another fact in favour of such localisation is that patients, after hemiplegic strokes, so frequently show signs of irascibility.

8. Another fact in favour of this localisation in the temporal lobe is that "word-deafness" and irascibility go together; whereas we have seen in lesions of the middle parietal area that "word-blindness" and "melancholia" are more often associated.

9. Lastly it appears that electric excitation of this brain-area in animals is confirmatory of this localisation, inasmuch as it produces symptoms of rage.

CHAPTER IV

I.—MANIA OF SUSPICION AND PERSECUTION

WITH 45 CASES OF LOCALISED BRAIN-LESION

1. The Origin of Delusions of Persecution—Seat of Lesion in the Brain.
2. Mania of Persecution due to Injury.
3. Cases of Melancholia with Delusions of Persecution.
4. Violent Mania with Delusions of Persecution.
5. Mania of Persecution resulting from Ear Disease.
6. Cases of Mental Recovery after Treatment of Ear Disease.
7. Cases of Recovery after Excision of the Affected Portion of the Cortex.
8. Conclusions.

II.—KLEPTOMANIA

WITH 16 CASES OF LOCALISED BRAIN-LESION

III.—THE BRAIN-CENTRES FOR HUNGER AND THIRST

40 CASES OF VORACIOUS HUNGER AND ABNORMAL THIRST WITH LOCALISED BRAIN-LESIONS

CHAPTER IV

1. MANIA OF SUSPICION AND PERSECUTION

1. The Origin of Delusions of Persecution

"DELUSIONS of persecution are due to suspicion. Suspicion is a protective instinct. Such delusions are mere exaggerations of a necessary mental quality." (CLOUSTON.)

Delusions of persecution will be shown to be connected with lesions of the postero-temporal area of the brain.

The delusions are not attributable to perversions of the reasoning process, but arise out of the perverted emotional state. This gives rise to a misinterpretation of actual occurrences in accordance with the prevailing state of the feelings. When the false ideas are habitually dwelt upon, they become realities to the consciousness of the individual. The memory and argumentative power are perfectly retained, especially in the early stages of the disorder, and we might converse with a patient for

a long time without suspecting that there was anything wrong with him.

Delusions of persecution may occur without any other signs of disease, and they may occur as complications in melancholia as well as in mania furiosa. The latter two are merely extensions of disease already existing, from the central parietal area in melancholia and from the central temporal area in mania furiosa to the temporo-parietal convolutions.

The "persecuted" insane may commit suicide, but not for the same reason as the "melancholiac," who thinks life is no longer worth living. The "persecuted" insane does not reflect on death at all, he simply tries to escape from his imaginary persecutors. If he happens to be on level ground, no harm need follow; if he is on a fifth-floor corridor and he can get out at the window, he may make an attempt to do so with the necessary consequences, but it cannot be said that he is conscious of the fatal result, or that he seeks it.

Associated with delusions of persecution are, almost constantly, hallucinations of hearing. Considering the proximity of the posterior temporal area to the internal ear, this cannot surprise us. For the same reason deaf people are particularly subject to ideas of suspicion and persecution. Hallucinations of hearing, due to ear disease, are almost always of a threatening nature.

In 47 cases of systematical delusions at the Boston Lunatic Hospital, Dr. Fisher found that hallucinations of hearing existed in every case but two.—(*American Journal of Insanity*, July, 1888.)

Dr. Boucheron observed mental troubles of suspicion and persecution accompany ear disease.—*Gazette des Hôpitaux*, 1887.)

Prof. Fürstner of Heidelberg, writing on "Mental Derangements Accompanying Ear Disease," gives as the result of his observation, that the noises produced in ear diseases often give rise to delusions of persecution or at least to ideas in the patient that his friends or neighbours have some ill-feeling against him. Frequently, particularly when the inflammation is acute, and pus is formed in the tympanic cavity, there occur sudden attacks of excitement, sometimes of violent destructive mania, probably through extension of the inflammation to the meninges. With the treatment of the ear disease, and as the disease disappears, so do the mental symptoms disappear as well.

2. Mania of Persecution due to Injury of Posterior Temporo-Parietal Area, and other Cases

Julius Kratter.—*A medico-legal case.*—Josef Hö., while walking with some companions, had, as afterwards was shown, a momentary delusion of persecution, and this delusion incited him to knock one of his friends down, and, when attacked by the other, he stabbed him several times, apparently in self-defence. On arrival home he boasted of his intention to murder thirty persons, and became very noisy and threatening. Numerous witnesses declared Hö. to be a violent, threatening, and dangerous man, and that the change of his character dated from the receipt of an injury to his head.

The first medical opinion declared Hö. to have been conscious of what he was doing, and thus responsible for the act. He was believed to be simulating. A second examination of the state of the mind showed the defendant to be intellectually a very clear-headed man, definite in his statements, adhering to them under

cross-examination, having a good memory of facts and events, and never contradicting himself. He stated that, twenty years before, he was run over, and received a severe wound which caused him to be paralysed and speechless for a few weeks, and altogether indisposed for a whole month. A brother of his stated that since that time defendant had been intolerant to alcohol. Defendant remembered every detail of the act of which he was accused, but stated definitely that his two companions intended to kill him. Questioned further, he said he was not mad, he heard them distinctly arranging the plot, he knew what he was doing and was not going to let himself be murdered without some self-defence. It was then ascertained that defendant construed some remarks made by his companions in this sense, and when he walked faster to escape them they also followed him more quickly, whereupon he turned round and fought, with the result given above. In reply to enquiries by the medical experts, he admitted having other enemies in the village, and gave their names and their intentions. Asked why he did not prosecute his enemies, he admitted that he summoned one of them but the magistrate would not grant the summons. He believed the magistrate had been bribed.

The physical examination revealed the following anomalies; right side of face redder than left, paresis of Sympathicus on right side, also facial paralysis of same side. Over the ear at the junction of the right temporal with the parietal bone there was a depression the size of a five-shilling piece, holding three fingers easily. Superficial tissues were adherent. Scar not tender but sometimes painful. Right pupil larger than left. Opinion of experts that defendant had suffered for many years from delusions of persecution, that

these delusions dated from the injury and had increased when hallucinations of hearing appeared. Moreover, he construed everything that might be said or done in the sense of his delusion. Since the injury he had grown very irascible. In his anger he often spoke nonsense, and the laughter and remarks caused thereby by those around him only increased his irascibility and delusion. Simulation was declared to be out of the question.

In a postscript, the author states that the court handed the prisoner to the mayor of the district, to deal with him as he thought proper. The mayor intended to send him to a lunatic asylum at once, but a superior authority intervened so that Hö. was left at large. He immediately resumed his threats and violent behaviour, and to such an extent that the local people had to petition the government to place Hö. in an asylum since he was a public danger. Dr. Kratter added a specific certificate. Only then was Hö. secured.—(*Friedreich's Blätter für gerichtliche Medizin*, 1889, vol. xl.)

F. Jolly.—A Bavarian soldier was shot in the Franco-German war, the ball entering the right cheek, smashing the lower jaw, and issuing close to the mastoid process. Four months later followed mania of persecution and excitability. Delusions. Painful scar.—(*Archiv für Psychiatrie*, 1872, vol. iii.)

Paul Schüller.—F. B., 16½ years old, an apprentice, with ear disease from his earliest youth, received a blow in a fight, with a piece of wood which broke into pieces. It hit him at the posterior junction of the right temporal and parietal bones, leaving a scar. He became insane on the following day. He suffered from extreme mania of persecution. He was in fear of being hacked to pieces and of being poisoned; he was suspicious of everybody and everything, and to defend himself became extremely noisy, violent, and made attempts at homicide.—(*Psychosen nach Kopfverletzungen*, Leipsic, 1882, Case 2.)

Charles Phelps.—*A case of recovery.*—Male, aged 45 years, thrown from a truck in a collision. Unconscious. Third day ecchymosis over right mastoid process and extending upon the back of the ear. At the end of the week he regained some power of memory, but was still irra-

tional and required restraint. The following week he was sensible, and considered it an outrage to find himself subjected to having his temperature taken. He had delusions, saw imaginary persons, and heard scoffing voices, and was easily annoyed when spoken to. In the third week he got well. His mental faculties were completely restored.—(*Traumatic Injuries of the Brain and its Membranes*, London, 1898, Case 240.)

Ludwig Schlager.—Patient ran a piece of pointed wood into his head, causing a depression close to the mastoid process behind the right ear. He remained unconscious for several hours. In the course of half a year he showed gradually increasing excitability with delusions of persecution, frequently attacking those around him. There were noises and defects of hearing in both ears. Before his death he developed epileptic fits.

The autopsy revealed a hole in the skull at the point of injury on the right side, an abscess-cavity at the corresponding point in the temporal lobe, the size of a walnut. The surrounding brain substance was softened. The interesting point was that symmetrical to the lesion on the right side the left temporal lobe showed also loss of substance, the size of a bean.—(*Zeitschrift der Gesellschaft der Aerzte zu Wien*, 1857, Jahrg. xiii.)

R. v. Krafft-Ebing.—J. G., 43 years old, no hereditary taint, hitherto healthy, received a shot on left side of the head and suffered for years afterwards from giddiness and noises in the ear. Four years after the injury great restlessness set in, which soon graduated into outbursts of rage with some delusion as to being treated badly by his superiors. After wasting much time and money on lawsuits, he was admitted to the asylum. He still complained of headache, giddiness, and noises in the ear, and his delusions of persecution continued and occupied his attention so much that it often came to outbursts of fury and excitement. He died of pneumonia.

Post-mortem.—There was no injury to the temporal bone visible, but the bone was quite thinned and the diploë had disappeared almost wholly from the middle fossæ. —(*Über die durch Gehirnerschütterung und Kopfverletzung hervorgerufenen psychischen Krankheiten*, Erlangen, 1868, Case 8.)

Landerer and Lutz.—G., merchant, 41 years of age, after an injury to the head which led to bleeding from the ear, suffered from acute mania of persecution based on illusions and hallucinations of a fear-inspiring nature.—(*Report of the Private Asylum "Christophsbad" in Göppingen*, Case 19.)

The same Authors.—H., shoemaker, 30 years old. Received a blow in the left temporal area which rendered him unconscious, and for some time deaf in the left ear. Mania of persecution developed. He became violently aggressive and highly dangerous.—(*Ibidem*, Case 22.)

W. Julius Mickle.—A soldier aged 35, in service 18 years. The right temple had been struck by a shell before Sebastopol. After severe syphilis, acute pain and great tenderness over the right mastoid process and right temple. Dr. Mickle says: "Delusions and excitement obtained from the first, these continued at Netley, and he became impulsively

violent towards other patients, under the false notion that they came into his room at night and annoyed or injured him." At Netley he had hallucinations of hearing and delusions of being constantly tormented. At one time there was severe shooting pain in the left temple with great tenderness. Dr. Mickle thought it probable there was syphilitic pachymeningitis of the postero-lateral part of the dura mater near the base. —(*British and Foreign Medico-Chirurgical Review*, July, 1876, vol. lviii., Case 6.)

Dr. Hartmann.—Newbold, 33 years old, had a cystic tumour power. fully extirpated from behind the ear. Since then, he complained of constant pain, had delusions of persecution with hallucinations, and became aggressive.—(*Archiv für Psychiatrie*, 1884, vol. xv., Case 31.)

K. Cramer.—A ranger, 62 years old, had an apoplectiform stroke, the signs of which soon passed away, but delusions of persecution set in on the following night. He took his gun down from the wall and attempted to shoot any one coming near him. He was suspicious, made threats, and was very noisy. He died four years later after another stroke.

Post-mortem.—Atrophy and cystic degeneration of the first and second left temporal convolutions extending to angular convolution.—(*Ibidem*, vol. xxi., p. 141.)

Dr. Dagonet mentions the case of a patient in whom was found a sarcoma extending to both sides of the lower parietal region and compressing the brain substance. He had delusions of persecution.—(*Annales Médico-psychologiques*, Jan., 1882.)

Ch. Vallon.—Patient, 35 years of age, had delusions of persecution. Four months later he had hæmatoma of right ear. He died a fortnight later of pneumonia.

Post-mortem.—There were sanguinary effusions on both sides in the posterior part of the temporo-sphenoidal convolutions.—(*L'Encéphale*, 1881, vol. i., p. 224.)

Tomaschewsky and Ssimonowitsch.—Patient, aged 33, always of good health, was frequently struck on the head by a drunken husband. She had subsequently several attacks of general convulsions which continued till her death. On admission, the principal symptoms were excitement, sleeplessness, delusion of persecution, and hallucinations of hearing. She heard with both ears the voices of her tormentors. There was chronic catarrh of the left Eustachian tube.

Post-mortem.—There were thickening, adhesion, and injection of the dura over the gyri supramarginalis and angularis and posterior half of first temporal convolution, and the brain substance of these parts appeared injected and wasted.—(*Wjestnik psichiatrii i nevropatologii*, 1888, vol. vi.)

Dr. Parchappe.—Male epileptic, 52 years old, excitable, delusions of persecution.

Post-mortem.—Sclerosis of temporal lobe in neighbourhood of cornu ammonis. —(*Traité de la Folie*, 1841, Case 269.)

Conolly Norman.—Very little life-record was obtainable about the patient. His age was 42. He was not an idiot. He entertained fixed persecutory delusions, chiefly to the effect that people in the gaol had put

beasts in his inside to torture him; that his chest was full of gnawing beasts, and so forth. He complained bitterly of his treatment, and said that the asylum authorities were conspiring with the prison warders to persecute him. No hallucinations.

Post-mortem.—Porencephaly involving the greater part of the left temporal lobe and supramarginal gyrus holding 16 ounces of perfectly clear fluid. The left parietal eminence and the left parietal cortex were distinctly more prominent than the right. —(*Journal of Mental Science*, Oct., 1894, vol. xlix., p. 649.)

H. A. Buttolph.—Mrs. P., aged 84, had been deranged about eleven years at the time of her decease. The first indications of derangement which her daughters observed was a fear that she was losing her property, and that they (her daughters) were secretly appropriating it to their own use. This suspicion was at first expressed cautiously, but she grew more and more bold in her accusations that they were taking her property unjustly, until at length she became entirely alienated in her feelings towards them—would say she meant to kill them, and would frequently, by open and by secret means, attempt to injure them. During the latter part of her derangement she became exceedingly violent in her temper, making unceasing efforts to injure and destroy everything in her way. Her language was often extremely vulgar.

Autopsy.—Skull prominently developed in the region of the parietal eminences. Softening of a greenish yellow colour of the posterior portion of the temporal lobe. —(*American Phrenological Journal*, March, 1841.)

Theodor Deecke.—W. H., 28 years of age, had epileptic convulsions when 14, that is seven years after fracture of the inferior portion of the left parietal bone. He was quiet and peaceable, but stared vacantly and answered questions slowly. Patient and his relatives desired an operation. Pressure at the seat of depression at the lower posterior angle of the left parietal bone produced pain and dizziness, but no convulsions. When the incision was made through the scalp over the depressed portion of bone a profuse hæmorrhage followed, estimated at fifteen ounces. The depressed bone was removed. The lower angle of the wound was left open. The following day the patient suffered from an acute attack of mania, raving, crying, fighting, in abject fear of an operation, calling for help and police and demanding pistols to defend himself. The same state on the following day, patient still impressed with the idea that some injury was intended. On the next day he died. No post-mortem. —(*American Journal of Insanity*, April, 1883, vol. xxxix.)

C. Price Tanner.—T. R., aged 33, married, telegraph clerk. The history obtained from his wife was to the effect that he had always enjoyed good health, and had had no illness till twelve months before admission. At that time he suffered from "writer's cramp," and was low-spirited. After a holiday he recovered. A month prior to admission he was found with right hemiplegia. Unconscious for four days. Paralysis improved, but his speech was, and remained, unintelligible. After being in bed about a fortnight he got up, and then was noticed an entire change in his moral character. From being a fond father he seemed to take an

aversion to his children, and was found by his wife more than once ill-using them. On one occasion he was holding one of them on the floor, kneeling over her with a knife in his hand. He became also very suspicious, and since his attack had slept with a hammer and knife by his bedside. He had also lately extra locks and bolts put on his doors. In consequence of his threatening behaviour to his wife and children it was found necessary to put him under restraint. He suffered from word-deafness and word-blindness. He died three months after admission.

Necropsy—The whole of the left insula was destroyed, apparently the result of a hæmorrhage, and the hæmorrhage had invaded the superior temporal convolution, and also part of the inferior parietal lobe, where it is adjacent to the fissure of Sylvius.—(*Brain*, vol. xiii., 1890.)

H. Schüle.—Hy., 39 years of age. The first characteristic of his mental derangement was his indecision, which made him incapable for mental work, and caused him to become irritable. The following year the symptoms increased, he made no more attempts to work, got bad-tempered, and more irascible. He had several apoplectiform strokes, which passed off, and after which his irascibility became more permanent. In his paroxysms of excitement he expressed delusions of persecution, tried to run away, shut himself up in other people's rooms to escape from his persecutors, who were going to kill him. He offered active resistance to those who came near him. Emotionally he was in a depressed condition ever since the commencement of his illness, and it was observed that the two parietal bones were asymmetrical, the right being curved much more extensively than the left; it also held more brain-substance, as was seen post-mortem. Patient got more and more paralysed, grew mentally feebler, and died, after four years' illness, of pneumonia.

Autopsy—Dura adherent to the posterior portion of the temporal bone. The right temporal lobe much atrophied, so was the left at the base. On section, a cavity ¾ in. in diameter, was found in the left temporal lobe. Large osteophytes in the middle fossa. Lateral ventricles dilated. The posterior end of the superior frontal convolution had a depression on each side.—(*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874, Case 9.)

Dr. Bourneville.—Marie Gail, 45 years old. Family history good. The disease started three months prior to admission, after a robbery of which she was the victim. From that moment her mind became deranged. She saw thieves everywhere, and though she had double locks put on, she still believed she was being robbed. She called after the thieves, and climbed on to the roof to catch them. In one of these attacks she ran out into the street in her chemise, and was arrested and conveyed to the hospital. Though she was reported to have had epileptic fits previously, none was ever seen while at the hospital. She gradually became permanently demented, and died after four years' residence.

The post-mortem examination showed, besides lesions of the right and left frontal lobes, destruction of the right temporo-sphenoidal lobe, dilatation of both lateral

ventricles, especially the right one. The parietal and occipital lobes were normal.—(*Archives de Neurologie*, Paris, 1880-81, vol. i., Case 4.)

Edwin Goodall.—*Recovery.*—Male patient, 29 years of age, previously healthy, always temperate. No hereditary tendency. Six weeks before admission he received a kick from a horse on the left mastoid process, which rendered him unconscious. He bled from left ear. After coming round he developed marked delusions of suspicion, and exhibited violence, so that he had to be transferred to Hanwell Asylum. Considerable scar over left mastoid process. Complete left facial paralysis. The delusions of suspicion continued till a month after admission, when he became rational. Discharged three weeks later, and a month after discharge patient reported himself well and at work.—(*Lancet*, 10th December, 1898.)

T. Duncan Greenlees.—James K., aged 53, had been insane for eighteen months previous to admission, consequent upon a paralytic seizure. In course of time the paralysis partly disappeared. On admission he had a suspicious look, was very restless, and had the fixed delusion that persons wished to poison him. During his residence he was passionate and became easily excited. If left to himself he was dull, and would speak to no one, preferring the solitude of his own company. Eighteen months after admission he had a paralytic seizure, accompanied with aphasia. Death occurred nine days after the seizure.

Post-mortem.—On stripping the pia mater of the left hemisphere, part of the lower parietal lobe, the whole of the temporo-sphenoidal lobe, together with the island of Reil, were found lacerated. The temporo-sphenoidal was in a state of red softening, and broken down into a cavity.—(*American Journal of Insanity*, April, 1887, vol. xliii., Case 2.)

3. The following are Cases of Melancholia with Delusions of Persecution

W. Fraenkel.—*A medico-legal case.*—S. A., a very conscientious woman, 29½ years of age, whose house was burnt, including all her property which was not insured, interpreted some remarks by the neighbours as meaning that her husband had caused the fire. Fearing his arrest, she got into a state of terror and left quietly, with her two children, the scene of her misfortune. An hour afterwards her cries were heard from a pond in the neighbourhood, where she had drowned her children and made an unsuccessful attempt to take her own life in the same way. She was arrested. At the trial she remained reticent, but be-

trayed in every feature and look her extreme anxiety, and gave the judge the impression that she felt her guilt so much that she was afraid to betray herself if she spoke. Expert evidence showed that her silence, refusal of food, sleeplessness, and fever, etc., indicated some mental derangement. She was sent to the psychiatrical clinic for further observation. She was found much depressed, but this condition had begun long before the fire. She was also hereditarily tainted. On her head in the region of the parietal bone some ulceration was observed. Her fever increased, and with it her fear of death. She asked for a priest and confessed to him that she herself laid the fire to get away from the town, which she abhorred, and gave details of the preparations she had made to fix the suspicion on others, which confession left the impression on the judge, to whom she repeated it, that she had told the truth and was not under a delusion. She died of pyæmia.

Post-mortem.—There was necrosis of the parietal bone with loose pieces, the parietal lobe being covered with pus, which had made its way to the temporal area and middle fossa. Dr. Fraenkel thought the necrosis was the result of an injury.—(*Allg. Zeitschrift für Psychiatrie*, 1869, vol. xxvi.)

Otto Hebold.—H. G., manager of a factory ; destructive impulses and delusions of persecution ; barricaded his room to escape from his assassins. Loss of speech, but could calculate correctly. States of fear interchanged with states of excitement up to his death.

Post-mortem—Ivory exostosis on the left parietal bone, softening of supramarginal convolution. Pia over Sylvian fossa thickened. Both temporal lobes, more especially the left one, atrophied.—(*Ibidem*, 1894, vol. l., Case 2.)

H. Schüle.—M. Bergdorf, 36 years old, became insane after returning from a religious meeting, and talked deliriously on religious subjects. He was very excited, and had to be bound down. On admission the whole of the left side of his body was anæsthetic, and there were some signs of mild paresis as well. The patient expressed delusions of persecution, of being butchered, etc. The angles of the mouth and eyes were tremulous, first on the left, then on the right side ; speech was indistinct. After three weeks the right side of his body became anæsthetic. He fancied he had not the head with which he was born, that

all the people had turned heathens, etc. He died of gangrene of the lungs.

Post-mortem.—A carcinoma of the inferior parietal lobule with softening of the surrounding convolutions.—(*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874, Case 19.)

F. Baizer.—Joseph Flory, lamplighter, 62 years old, born in Alsace, admitted with symptoms of word-deafness and amnesia, which had existed for eight months. On being questioned the attempts to reply both fatigued and irritated the patient considerably. He then began to swear in German, though he was aphasic for German as well as for French. He was in a state of incessant agitation both day and night, which agitation and his melancholia increased with the length of his illness. He died of pulmonary phthisis eight months after admission.

Post-mortem.—An immense area of softening was found to occupy, in addition to the superior and middle temporal convolutions, the inferior parts of the parietal lobe.—(*Gazette Médicale de Paris*, 1st March, 1884, vol. ix.)

4. The following are Cases of Violent Mania with Delusions of Persecution

A. Köhler.—*Medico-legal case.*—A woman, 47 years of age, a habitual thief with long records of imprisonment, whose trials were always interesting by reason of the craftiness with which she planted the guilt on others, became quarrelsome and violent in manner. Four weeks after being discharged she committed another theft and received one year of hard labour for it. But this time her mental state obtained notice, and she was sent to an asylum. Her violence was accounted for by horrible delusions of persecution with hallucinations of the same kind; she saw only enemies, detected poison everywhere, but unlike a melancholiac who would simply refuse to eat, she destroyed the plates and dishes and behaved altogether outrageously. She remained in this condition for years. Gradually paralysis set in. She died of phthisis.

Post-mortem—There was softening of the temporal lobe and the medulla.—(*Allg. Zeitschrift für Psychiatrie*, 1877, vol. xxxiii.)

George H. Savage.—Sarah N. Nagle, aged 35. Aunt and cousin insane. Father died of "brain softening." About five years prior to admission she had a love disappointment, and since then on several

occasions had had short attacks of mental excitement, but these rapidly passed off, leaving no mental deterioration. A few days before admission she became rather suddenly noisy and violent. Fancied people had knives concealed and meant to murder her. She said "her bed was an infernal machine," and that she was "surrounded by devils." She had wonderful visions, talked incoherently, and was very violent. On admission, she was noisily and incoherently happy, talking and laughing constantly day and night. She was kept up for some ten days or so, but was always rolling about the floor, and taking off her clothes. For her own sake, she was kept in bed, and there remained more quiet, though she talked and shouted constantly. Hemiplegia the following month. She died, a week after, of pneumonia.

Post-mortem.—On removing the calvarium, the right temporal lobe was noticed to be flattened and bulging; on making a slight incision, more than an ounce of thick gluey pus escaped, disclosing a thick-walled abscess occupying the whole of this part of the brain. There was no communication with the ventricles, or with the outside of the brain. There was no diseased bone about the ear or elsewhere; the membranes were free over the abscess. The arteries were patent and normal. The corpus striatum and also the thalamus were softened and broken up. Over the whole brain the membranes were separable, the rest of the brain was in appearance normal.—(*Brain*, 1878, vol. i.)

W. Charles Hood.—M. A. J., a female patient, died of general anasarca and disease of the heart, after seventeen years' residence. She was married, and mother of three children. When first admitted she was in good bodily health, but under perpetual morbid fear of being murdered. She often started off with intent to escape from some imaginary persecutors, and in time became more subject to sudden outbursts of passion and violence. Her conversation was frequently very obscene.

Autopsy.—The cerebral substance of the postero-lateral part of the brain on both sides was extensively and deeply disorganised.—(*Journal of Psych. Medicine*, 1858, vol. xi.)

T. C. Shaw.—M. R., aged 34, married, had four children, the last fifteen months before. Present disease started with difficulty of lifting right arm, two months before admission. Soon after she had a sudden attack characterised by loss of consciousness, which was said to have lasted two weeks, with inability to speak and loss of hearing. Since the attack she talked sensibly for a few minutes only, and then became incoherent. Patient told her sister that the attack was preceded by a pain in the right ear, then pain in the left ear and side of head, and then she knew no more. No further attack since.

The certificate committing her stated that she said some men were trying to kill her, and she screamed without cause, and was at times violent. On admission patient gave no answer to questions. She talked disconnectedly, and at times screamed out. A month later she had a severe epileptiform fit, afterwards for days restless, tearing about and screaming aloud, very noisy at night. After a year she had become quite noisy, talking and screaming unintelligibly night and day.

Post-mortem.—The superior and inferior parietal convolutions were atrophied, and the superior temporo-sphenoidal convolution of both hemispheres was only one-fourth the normal size, and in some parts even less. On microscopic examination of the atrophied convolutions it was found that the grey matter had disappeared, and only connective dense tissue filled with nuclei could be seen.—(*Archives of Medicine*, New York, 1882.)

5. Mania of Persecution resulting from Ear Disease

J. T. Eskridge.—J. P., male, aged 30, Colorado ranchman, contracted typhoid fever, a month later he was fairly convalescent from fever, but the disease had left him with a purulent discharge from the right middle-ear. During the following fortnight he was observed to be getting irritable, and one day was found in bed delirious, and with the delusion that his attendants were trying to kill him. His eyes followed the physicians and people in the room, as if suspicious of the actions of those by whom he was surrounded. He accused his attendants and Dr. Eskridge of seeking an opportunity to kill him, and cursed them accordingly in the unpolished language of a western ranchman. The doctor received profane abuse for every question that he put to him. There was a sinuous or semi-purulent discharge from the right ear, slight in amount but offensive in character. His appearance was depressed and anxious. His left arm and muscles of left angle of mouth were paretic. He was trephined and a large abscess cavity emptied, but the patient's improvement was only of short duration, and he died on the fifth day.

Post-mortem.—Besides this cavity pus was found on the petrous portion of the right temporal bone with meningeal inflammation around.—(*Journal of Nervous and Mental Disease*, June, 1889, vol. xiv.)

Albert Rosenthal.—Case of a patient, 25 years of age, with ear disease, which in three months' time left him deaf. Simultaneously therewith mental derangement took place, the patient having delusions of persecution and attacks of maniacal fury. To escape from his persecutors he made an attempt to jump down from a fourth-floor window.

The excitement never abated. Epileptic convulsions followed in such rapid succession that he was dead in a few hours.

Post-mortem.—There was a focus of yellowish softening in the right temporal lobe extending to the external capsule.—*Centralblatt für Nervenheilkunde*, 15th May, 1884.)

George C. Catlett.—M. G., aged 50, insane five years, hearing defective in both ears, the result of catarrhal otitis media. He had been the subject of auditory hallucinations during the entire period of his insanity. Every night he stopped all the cracks, crevices, and keyholes in the windows and doors of his room, to prevent the intrusion of persons, whose evil whisperings disturbed his repose.—(*American Journal of Insanity*, July, 1877, vol. xxxiv., Case 2.)

John Keay.—The patient, 50 years old, was suffering from monomania of suspicion of about a year's duration. He had auditory hallucinations. Mentally he was an excitable, irritable monomaniac, full of delusions of suspicion. He charged people with hatching plots to do him injury, was extremely hot-tempered, and answered the most civil remark with a torrent of abuse, and threats of civil action or physical violence. Thus he continued for four months when his hitherto robust health declined, his appetite failed, and his weight diminished. It was then observed that he frequently placed his hand on his right temporal region, and at the same time it was noticed that there was a slight purulent discharge from the right ear, in which he seemed deaf. Patient resisted all personal examination ; a month later he had fever and became semicomatose. There was a swelling with tenderness on pressure over the mastoid bone. It was agreed that the case was one of basal meningitis, arising from the purulent otitis media. The skull was trephined half an inch posterior to the external auditory meatus, and the pus allowed to discharge. Improvement seemed to follow the operation, but the patient died the following day.

Post-mortem.—The convolutions of the temporo-sphenoidal lobe on the right side were softened. The walls of the ventricles were also soft, and they contained a quantity of semi-purulent fluid. The pia mater at the base was much congested, and covered with pus.—(*Journal of Medical Science*, October, 1894, vol. xl.)

6. The following are Cases of Mental Recovery after Treatment of Ear Disease

W. Rhys Williams.—Charles D. C., 26, married. Had enjoyed good health. Industrious and sober. Some few days before admission he became excited, noisy, and violent. He was continually swearing and screaming out violent language, said he saw devils, was noisy and sleepless at night. On admission he was

violent and noisy. Six months later it was noticed that he had a profuse purulent discharge from the left ear. He said he had had this for months past. Hearing seemed unaffected. Slowly a large puffy swelling formed over the left mastoid process, and spread up over squamous portion of temporal bone. On pressing this the discharge ran freely from the meatus. The swelling steadily increased for a month, but the patient was sullen and dangerous, and would not allow any one to examine him. He fancied the doctors wanted to injure him. He was at times abusive. The following month the abscess was opened under ether spray, and he *became sane at once.* No further discharge took place from the ear.—(*Lancet*, 28th April, 1877 ; and *Journal of Mental Science*, April, 1879, vol. xxv.)

Dr. Koeppe.— Richter, a miner, sustained, when 31 years of age, a fracture of the base of the cranium, was eight days unconscious and ill for three months. He became somewhat deaf and there continued a buzzing in the right ear. Ten years after the accident he became mentally changed. He suffered with delusions of persecution: people robbed him of everything ; he refused medicines ; people intended to poison him, they spoke badly about him ; he threatened to kill his wife and children and to commit suicide afterwards. The otorrhœa got worse and with it his delusion. When the disease was healed and got well, *his mental derangement disappeared completely.*—(*Archiv für Ohrenheilkunde*, Leipsic, 1875, Case 1.)

E. Régis.—A young man, 22 years of age, received, when 13 years old, such a severe box on the left ear, that purulent middle-ear disease resulted from it, which became chronic. Typhoid fever in his sixteenth year made the ear disease worse, and he became quite deaf in the left ear. Since then he had hallucinations of hearing of an insulting character, such as " thief," etc., yet the patient was conscious of their origin

and had no delusions about them. **Local treatment of the disease made the hallucinations disappear.**—(*Annales Médico-psychologiques*, May, 1882.)

M. B. Ball.—A young man, 22 years of age, with healthy antecedents, developed a purulent otorrhœa on left side when 13 years of age. The tympanum was perforated. When 16 years of age he had typhoid fever. From that period he lost his mental equilibrium, had storms of violent rage without any motive, and caused so much destruction in these attacks that he had to be placed in an asylum. His intellect was found perfectly clear, but since his otorrhœa had ceased, about three months before, he had hallucinations of hearing. He heard insulting voices on his left side, on which side he was completely deaf now, and often turned round to reply to them. A middle-ear affection was diagnosed, he was properly treated for it, the **hallucinations disappeared, and he was able to go home quite a normal man again.**—(*L'Encéphale*, 1882, vol. ii.)

7. The following are Cases of Mental Recovery after Excision of the Affected Portion of Cortex

G. Burckhardt.—*Melancholic and persecutory delusions. Cure of the latter.*—B. B., 37 years old, widow, had hallucinations of hearing in both ears for eight years. The voices were insulting her. In addition she had melancholic delusions. She was jealous that her sister was robbing her of the love of her child, and when she heard voices prompting her to kill them both, she of her own accord sought admission to the asylum. She wept a good deal, at times got irritable and irascible, but the two constant elements were the hallucinations of hearing and delusions of persecution, against which she defended herself and thereby sometimes became aggressive. An operation was performed, *removing the posterior part of the first and second temporal convolutions.* It had the effect, that she became temporarily paraphasic, the hallucinations of hearing continued *but without their previous effect, that is to say, not giving rise to any delusions of persecution.* This symptom disappeared altogether. Yet

her hypochondriacal melancholia[1] seemed to become more prominent, she imagined herself unhappy, and continued to weep a good deal. It was thought that this condition would improve if she went home to her friends, and it turned out so. She was delighted with the company of her child, worked for the same in the household, and was no longer jealous of her sister. She seemed quite happy. On New Year's Day she went out to buy some presents, but did not return. Two days later her dead body was dragged from the river.—(*Allg. Zeitschrift für Psychiatrie*, 1897, vol. xlvii., Case 3.)

The same Author. — Mrs. B., married, healthy up to 34th year, suffered from nervous prostration in that year, and was admitted in the following year with melancholia and tendency to suicide. Occasionally she seemed to have delusions of persecution. She became dangerous to those around her. Her general mental state remained for 16 years one of depression. One of the most repeated requests was not to kill her. Dr. Burckhardt removed four strips of the cortex in four operations. In the first operation, a strip of the anterior and upper part of the right parietal lobe ; in the second, a strip of the *posterior part of the first and second right temporal convolutions* was removed ; in the third, part of the *left gyri supramarginalis and angularis* was removed ; in the fourth, the pars triangularis of Broca's convolution was removed without influencing her speech. **Dr. Burckhardt claimed that patient became quiet and friendly, lost her desire for attacks and abuse, and instead of the depressed condition became lively and communicative.**—(*Ibidem*, Case 1.)

The same Author.—The subject was a man of 35, who had been four years in the asylum. He was suspicious, had fear of being poisoned, became threatening, heard voices, and was violent and destructive. Dr. Burckhardt trephined for the auditory centres *above left ear*. The brain was found of a slate colour ; about 2.8 grammes were removed. The patient did not become word-deaf after this operation, but the **hallucinations became less intense and the mental condition became improved.** He was now perfectly quiet and took an interest in things. —(*Ibidem*, Case 4.)

The same Author.—M. M., artist, delusions of persecution with hallucinations of hearing which excited him. Pain in the temples,

[1] The seat of lesion in "Melancholia" has been demonstrated in Chapter II. to be in the *parietal* lobe ; Dr. Burckhardt removed only the *postero-temporal* area, which is connected with "delusions of persecution."

irascibility gradually increasing. The first operation tried was excision of a portion from the auditory area, weight 4.6 grammes. Eight months afterwards it was intended to excise a portion of Broca's convolution, Dr. Burckhardt mistook it for another convolution, which was removed without intention. After the first operation he lost his irascibility, but the hallucinations, though not so frequent, remained. After the second operation he spoke and wrote less, and **his mind was clearer.** He began to draw again, could play a game of cards or billiards correctly, became polite and more obedient.—(*Ibidem*, Case 5.)

The same Author.—D. W., a labourer, 33 years of age, had delusions for three months that his fellow-workers wanted to do away with him; that they despised him, that they laughed at him. He heard people speak about him outside his window at night. When admitted he was quiet but suspicious, and gave expression to delusions of persecution. A month later he had an idea that he was going to be buried alive; in terror he jumped out of bed and injured himself. The following night some voices bade him attack his neighbour, which he did. His fear increased very much, and he now brought self-accusations, and he made some attempts at suicide. The removal of the posterior part of the first and second temporal convolutions led to sensory aphasia. On the fourth day after the operation he had epileptic attacks every ten minutes, and died on the sixth day.—(*Ibidem*, Case 6.)

8. Conclusions

From the foregoing clinical records it would appear that lesions of the *postero-temporal* area of the brain give rise to "delusions of persecution." This observation receives strong support from the following:

1. That injuries to the corresponding region of the head are liable to be followed by such delusions.

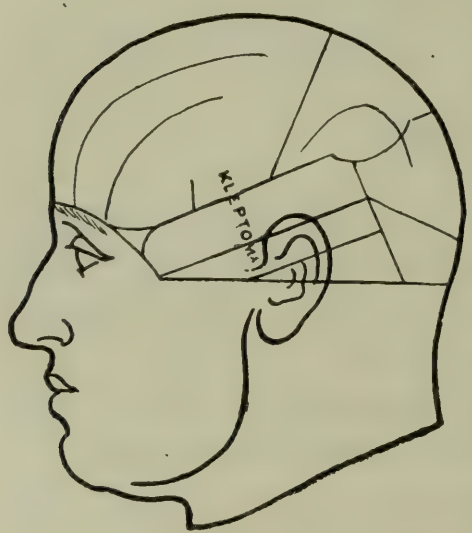
2. That extension of ear disease is one of the most frequent causes of this form of mental derangement, and that with the cure of the ear trouble the patient recovers also mentally.

3. That removal of this part of the cortex seems to bring relief to the patient.

CHAPTER IV—*continued*

2. KLEPTOMANIA

GALL observed on his visits to asylums and prisons that men who had uncontrollable tendency to theft had the *anterior part of the temporal region* (close to the anterior superior angle of the parietal bone) very prominent. He cited numerous cases, and gave various illustrations in his large work. Spurzheim would not admit an "instinct of theft," but reasoned that there is a "desire to acquire," which is natural to every one. It is the hoarding instinct of the animal, but in man it is guided and controlled by the intellect and moral faculty. In the child this instinct shows itself quite naturally. The child will seize everything and appropriate what does not belong to it. Idiots and imbeciles will steal, the intellect being deficient to check the animal instinct. Love of possession is a natural disposition implanted in the human organisation, and dishonesty is only the result of the absence of controlling motives.



Cesare Lombroso cites a case which he calls one of moral insanity, which is one of the best examples of the morbid love of hoarding, the impulse to acquire objects or money, or "kleptomania," arising from an injury to the head, to be found in medical literature.

The man in question, 64 years old, a rich citizen, was renowned for his sordid avarice. He was found to have an immense inclination to theft. He kept a set of burglary instruments, by means of which he robbed not only his own servants, whom he frequently changed, but the guests whom he invited to his house and entertained there. The proceeds of his robberies he sold. (Kleptomaniacs usually keep the articles and do not turn them into money.)

This man fell, when a boy, 8 years of age, from a height on to a stove, and injured his left temple. He lost his left eye through the accident, and the temple bulged for ever afterwards. Lombroso very correctly thinks that this injury had caused changes in the brain which produced these morbid inclinations. Here would have been a case for the surgeon.—(*Archivio di psichiatria*, Torino, 1882, page 43.)

Ludwig Meyer.—Wilhelm H., stone-mason, 33 years old, overworked himself, being anxious, as he said, to save some money for his children. One day after a prolonged exposure to the sun's heat, he fainted and afterwards became irascible. Simultaneously he developed a delusion that he might starve, and to save himself he often asked excessive wages for his work, but inasmuch as the results of his work only deteriorated, he was discharged. He then went out thieving; for some days he stole loads of fish, at another time a cartload of wood. At the institution he loved playing

at cards, but was only pleased when he could win. He died of an apoplectic stroke.

Post-mortem.—A cyst in the anterior part of the left temporal lobe, with degeneration of the surrounding brain-tissue.—(*Archiv für Psychiatrie*, Berlin 1872, vol. iii., Case 38.)

Dr. Zierl.—*Medico-legal case.*—L., aged 34, was wounded in the left temple in the war of 1870. The wound healed only after a year. Since then patient, who was previously mentally sound and honest, had *a delusion that everything he saw belonged to him.* He suffered from headache and giddiness. There was a depression in the bone to which the superficial tissues were adherent, which became tender on pressure and in changes of weather. L. was accused of having appropriated the proceeds of the sale of goods belonging to his firm, but his principal admitted that he considered him not quite sound mentally, and that he had returned the value of the goods. L. had been sentenced eleven times before for similar offences. He was sent to the asylum for observation, where paroxysms of irascibility were noticed, which were accompanied by a delusion that everything that he saw belonged to him. Acting on this delusion he had kept other people's property, and hence the numerous committals for embezzlement. He was declared not guilty, as suffering from epileptic mania.—(Friedreich's *Blätter für gerichtliche Medizin*, 1882, Case 2.)

H. Kurella.—Impulsive thefts of a choreatic girl, Louise M., with attacks of unconsciousness. Both temporal bones were bulging.—(*Allg. Zeitschrift für Psychiatrie*, 1895, vol. li.)

R. v. Krafft-Ebing.—O. D., 39 years of age, labourer, single, hitherto healthy, had a fall over a staircase in which he knocked his head, just above the right ear, so hard that he remained for some time unconscious. Apart from the swelling of the part there were no signs or symptoms, and patient quickly recovered. Soon, however, he developed two morbid tendencies for which he was sent to the asylum two years after, kleptomania and voraciousness. He could not dis-

tinguish what was his own and what was other people's property. He showed some maniacal excitement occasionally only ; as a rule he was quiet. **The kleptomania continued up to his death** four years after the accident. No autopsy.—(*Über die durch Gehirnerschütterung und Kopfverletzung hervorgerufenen psychischen Krankheiten*, Erlangen, 1868, Case 2.)

The same Author.—G. G., 58 years old, a farmer, hitherto healthy and not tainted, was run over when 23 years of age by a cart laden with stones in such a manner that the wheels went over his head and produced a dent in the bones over the left ear. On recovering consciousness there was only a slight mental change, in that he became subject to occasional paroxysms of anger. Only two years prior to admission did these paroxysms increase in intensity, duration, and frequency. On admission it was observed that **he was an active kleptomaniac as well.**—(*Ibidem*, Case 16.)

The same Author.—J. L., healthy up to his twenty-first year, a quiet, peaceful man, was attacked one day and hit on the left side of the head over the ear, causing hæmorrhage from the ear. He was unconscious for nine days, and subsequently deaf in the left ear. Since that time he proved irascible, violent, avaricious, and **covetous for money.** After killing a neighbour, he was sent to the asylum, where the same symptoms, including the kleptomania, continued.—(*Ibidem*, Case 25.)

Paul Guder.—Case 7 received an injury to the temporal bone, where two long scars were still visible over the ear. Since then paroxysms of furious mania lasting thirty-five minutes. He was trephined and appeared to have recovered, so that he was discharged after a five months' observation. The same day he was arrested for the committal of a theft.—(*Die Geistesstörungen nach Kopfverletzungen*, Jena, 1886.)

Dr. Kelp.—A. G., sailmaker, 38 years of age, showed besides a destructive propensity a disposition to hoard up things. His pockets were always full of pebbles and useless objects which he had collected. In the institution he would take anything he could lay his hands on, towels, combs, etc.

Post-mortem.—A limited hæmorrhagic effusion immediately beneath grey matter of right temporal lobe.—(*Deutsches Archiv für Klinische Medizin*, 1872, vol. x.)

Clovis Gallopin.—Louis Cheval . . . , aged 61, admitted for violent mania. Had a tendency to steal.

Post-mortem.—Softening of temporal lobe.—(*Annales Médico-psychologiques*, September, 1879, Case 2.)

Wm. Julius Mickle.—J. W. T., aged 47, married, had sustained a very severe blow on the head from a stone nearly two years previous to admission. The place struck was *in front and slightly above the left ear.* Patient became subject to delusions of all kinds, more particularly about money. In addition, he would secrete trifling objects about the house, and fill his pockets with coke.

Post-mortem.—There was decortication and adhesion of the left temporal lobe.—(*Journal of Mental Science*, October, 1885.)

Kenneth M'Leod.—W. L., stone-quarrier, suffering from violent mania. He was an inveterate accumulator, bringing together all sorts of things, secreting them, and returning them by every artifice. He was ready to steal when occasion offered. This kleptomania continued, but it was noticed that when he recovered somewhat he selected for accumulation articles of greater value.

Post-mortem.—Both external ventricles were excessively dilated, flattening the temporal convolutions.—(*Ibidem*, 1861, vol. vii., Case 1.)

The same Author.—D. S., aged 74, seaman, developed, six years before he became a general paralytic, a tendency to hoard things without any delusive belief of wealth or social position.

When he died, the left temporo-sphenoidal lobe was found softening generally, and converted into a grey pulpy matter.—(*Ibidem*, Case 2.)

E. Klebs.—An epileptic, 33 years of age, apparently of normal intelligence, fond of quarrelling, and always ready to strike any one, robbed people continually of their property, and was ever ready to use violence to obtain the desired objects.

Autopsy.—Neuroglioma involving the base of frontal and anterior part of temporal lobe, compressing these.—(*Vierteljahrschrift für praktische Heilkunde*. Prague, 1877, vol. cxxxiii.)

J. Christian.—V., 40 years of age, a retired officer. In the Mexican war he was struck by a ball which entered his skull through the left eye and escaped through the temporal bone. In consequence of this injury his intelligence became gradually enfeebled, and he developed, in addition to excessive irritability of temper, a tendency to steal.—(*Archives de Neurologie*, Paris, July, 1880, vol. viii., Case 10.)

Warren L. Babcock.—Case W. 1952, F. C., female, aged 31, violent maniac, destructive, is a confirmed kleptomaniac.

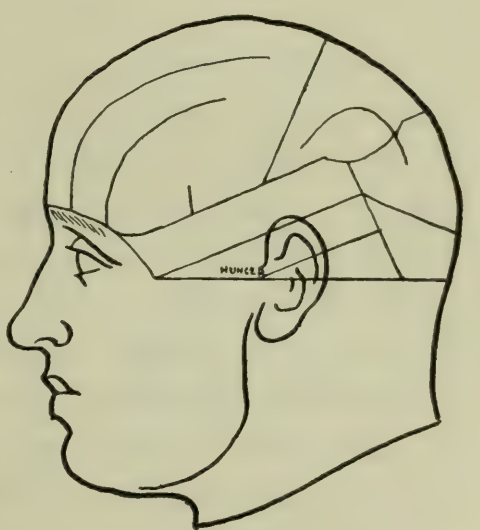
Excessive bulging of temporal bone on right side, making the head prominently asymmetrical.—(*State-Hospitals Bulletin*, New York, January, 1896, vol. i.)

See also A. Spanbock's case of kleptomania, after injury to temporal lobe, on page 132.

CHAPTER IV—*continued*

3. THE BRAIN-CENTRES FOR HUNGER AND THIRST

MR. STEPHEN PAGET, F.R.C.S., read a paper some three years ago "On Cases of Voracious Hunger and Thirst from Injury or Disease of the Brain," published in the *Transactions of the Clinical Society of London*, 1897, vol. xxx. In addition to Mr. Paget's ten cases, I shall produce thirty more in all of which the lesion was at the *anterior extremity of the temporal lobe*, and endeavour to analyse the physiology and psychology of this form of derangement. Hunger and thirst are commonly given in physiological text-books as marked and typical examples of "general sensibility" (also in Foster's text-book). On the other hand, impulses to satisfy hunger and thirst have always been set down as instinctive. Now, the feelings of hunger and thirst themselves prompt to the same sort of conduct as these so-called instinctive impulses. Indeed, it seems possible that the same inner core of the psychic happenings,



which in the one case is regarded as a visceral feeling, may be identical with that which, in the other, is named an instinct. What, then, should result if, instead of conceiving the inner core of the feelings of hunger and thirst to be the counterparts of certain visceral currents running to the brain, we were to turn squarely about and regard them as motor ideas seated congenitally in the brain, and let loose from it to prompt the creature to specific action for procuring sustenance? Unquestionably our attitude of investigation of such matters would be revolutionised, and a wider horizon would be given to the problem. We should now expect these instincts to be aroused in more than one way — by smell, by sight, and often by sound, as well as by a condition of the stomach. Moreover, since in cases of instinctive impulses aroused through sight, for example, of an animal at sight of its prey, we should think it ridiculous to seek an explanation of these instincts wholly in the eye, so we should now be led, maybe, to recognise how faulty it has been for physiologists to seek an explanation of hunger and thirst wholly within the viscera. Of course the mere turning to this wider view would not, of itself, solve all the mysteries of hunger, nor illumine beyond shadow all the realms of physiology, of insanity, and of emotion. But it would bring light into all these regions. It would enable us to understand how herbivora and other animals, whose stomachs are commonly more or less full, should yet feel hungry at the sight of food. It would enable us to imagine at least how hunger, proceeding from an empty stomach, may be explained in different ways, and yet in conformity with the conclusion that the viscera afford no direct sensory currents save of pain from pain-nerves, and of muscle-sense from

muscular contractions. It may be that the mere emptiness of the stomach, or again, the undue presence of its juices, incites muscular and peristaltic disturbances of such persistency or strength that they force their way to the tip of the anterior temporal region of the cortex, and thence arouse by association the proper instinctive feelings of hunger. Or in place of muscle sense, it may be that obscure and feeble pains are commonly the only direct visceral sensations, and these rising by pain-nerves (sympathetic) to the cortical centre. Again, all these things may be brought into line with the fact that long-continued hunger may be lessened and apparently satisfied by the injection of food into the bowels.

It is a small matter how hunger be explained,—whether as visceral sensation or as instinctive motive,—but the collateral issues are momentive.

H. Schlesinger gives, as the result of many observations on intelligent patients and physicians, his conclusion that the feeling of hunger consists of two components, one central and one peripheral.—(*Wiener klinische Wochenschrift*, 1893.)

W. C. M'Intosh wrote: "In the instincts of hunger and thirst animals eat and drink before they can know that food and drink induce that pleasant external sensation which constitutes the satisfaction of the instinct. But if the animals become conscious of the objects of the instinct the volitional element is added, and the blind impulse of nature co-operates with the inclination of the animal to obtain it. The blind instinct is become the volitional instinct for food and drink.

"In the pregnant, chlorotic, and hysterical female, as well as amongst the ordinary occupants of lunatic asylums, we find sometimes morbid desires, longings, or

impulses for various substances generally regarded with loathing and disgust.

"In bulimia the patient has an irresistible longing for food of a normal kind, so that an exaggerated form of gluttony results. This may occur first when the stomach is enlarged; and secondly, when it is of a normal size. Under either condition the person devours an enormous quantity at each meal—as much, indeed, as would suffice for three or four ordinary men, and yet he may be haggard and gaunt in the extreme. Amongst the insane, bulimia is common—some, having devoured their own ample allowance, seize upon all they can lay hands on, prowling about the entire day in search of food.

"Dipsomania or Oinomania signifies a disordered cerebral condition, in which the individual madly drinks to excess, yet may loathe the degrading stimulant."—(*Journal of Mental Science*, 1866, vol. xi.)

Dr. Hirsch says: "Anomalies of the propensities play great part in mental derangements. Like the other symptoms of insanity, abnormal impulses are but quantitative or qualitative modifications of healthy conditions. Psychiatry has never discovered any new passion. The appetites vary greatly in different individuals. The feeling of hunger, or the propensity to eat and drink, may in the most diverse psychical disorders be enormously exalted. . . . This is called hyperorexia. It sometimes goes so far that the patient tries to devour whatever he can lay hands on. This is called sitomania. On the other hand, the propensity may be distinctly lowered in intensity or even lost. This is called anorexia. Of course, none of these states includes cases in which the modification of the appetite is caused by derangements of the organs of digestion.

Finally, the desire for food may be directed to strange substances, as often happens to pregnant women. In the insane this perversion of appetite will sometimes be so great as to induce them to eat straw, earth, worms, and even their own filth."

Dr. Hoppe of Copenhagen was the first to observe a gustatory centre, and centre of the alimentive instinct in the brain. "In December, 1823, he expresses the opinion that, besides the nerves of the stomach and palate, of which alone he conceives the sensations of hunger and thirst to be affections, there must be also a centre in the brain of animals for the instinct of nutrition for the preservation of life, which incites us to the sensual enjoyments of the palate, and the activity of which is independent of hunger and thirst."—(*Edinburgh Phrenological Journal*, vol. x., p. 249.)

In a second communication dated 28th December, 1824, Dr. Hoppe gives the result of numerous observations of people notoriously fond of good eating and drinking, locating the centre of "taste" at the anterior extremity of the middle (temporal) lobe.

Dr. Crook of London mentions that several years before the publication of Dr. Hoppe's papers, he himself had arrived at similar conclusions with regard to this faculty and the position of its centre. He says: "Three persons, with whom I had become acquainted in the year 1819, first led me to suspect that a portion of brain situated near the front of the ear was connected with the pleasures of the festive board. From that time to the end of 1822 above a thousand observations were made. As they tended to confirm this view, several friends were informed of the result. From 1823 I no longer doubted that the anterior portion of the middle lobe was a distinct organ, and that its primary

use was the discrimination and enjoyment of meats and drink. It was difficult, however, to hit the fundamental power. The situation of the centre, under the zygomatic process and the temporal muscle, frequently precluded the possibility of accurate observation. But, notwithstanding, well-marked cases, both of a positive and negative kind, were investigated."

At the time much ridicule was thrown at the originators for localising a centre for hunger and thirst, those sensations being thought due to the stomach alone. Yet it is evident, from the forty cases quoted in this paper, that there is a centre of hunger and thirst at the anterior extremity of the temporal lobe, which observation was correctly made seventy years ago by Hoppe and Crook.

Dr. Ferrier's experiments confirm this localisation. His experiments on monkeys on the anterior and inner aspect of the uncinate gyrus, marked (15), had the effect of "torsion of the lip and semiclosure of the nostril on the same side, as when the interior of the nostril is irritated by some pungent odour." He says (p. 244, *The Functions of the Brain*, London, 1886): "Irritation of the middle temporo-sphenoidal convolution I have found in general to be without any obvious reaction, except towards the lower extremity, where in several instances movements of the tongue, cheek-pouches, and jaws were induced very much like those which are characteristic of tasting.

The same experiment on (15) the uncinate gyrus or extremity of the temporal lobe of dogs resulted in "torsion of the nostril on the same side, as if from irritation directly applied to the nostril." The same effect was produced by experiments on cats and other animals. He continues:

P. 315.—"As above described, irritation of the hippocampal lobule in the monkey, cat, dog, and rabbit was attended by essentially the like reaction in all, viz., a peculiar torsion of the lip and nostril on the same side. This reaction is precisely the same as is induced in these animals by the direct application of some strong or disagreeable odour to the nostril, and is evidently the outward or associated expression of excited olfactory sensation."

P. 321.—"As to the sense of taste, I have not succeeded in differentiating any special region related to this faculty, but that it is in close relation with the olfactory centre is probable from the facts described. It was noted in connection with electrical irritation of the lower extremity of the temporo-sphenoidal convolutions in the monkey, and of the same region in the brain of the cat, that movements of the lips, tongue, cheek-pouches, and jaws were occasionally induced—phenomena which might be regarded as indications of the excitation of gustatory sensation. This interpretation receives support from the above described results of destructive lesions, and we have, therefore, reasonable grounds for concluding that the gustatory centres are situated at the lower extremity of the temporo-sphenoidal lobes, in close relation with those of smell."

P. 431.—"The physiological needs of the organism, in so far as they induce locally discriminable sensations, express themselves subjectively as definite appetites or desires, which are the conscious correlations of physiological wants. The appetite of hunger is the desire to satisfy or remove a local sensation, referable to the stomach, in which the physiological needs of the stomach express themselves. The substrata of the feeling of hunger and appetite for food are the stomachic

branches of the vagus and their cerebral centres, and as local conditions of the stomach may destroy or increase the feeling of hunger, so central disease may give rise to ravenous appetite or sitophobia, conditions exemplified in certain forms of insanity."

Dr. Ferrier thus proves the tip of the lower temporal convolutions to be the "gustatory centre"; the very same centre which was localised in the same portion of brain by phrenologists seventy years ago.

Vimont gave an account of forty-eight children, two to seven years of age,—the skulls of eleven of them he kept in his collection,—all of whom were unquestionably gluttons and had this region large.—(*Traité de Phrénologie*, vol. ii., p. 174.)

In *Epileptics* we find frequently a lesion of the hippocampus, and, as I have shown in a preceding paper, frequently also disease of the adjoining temporo-sphenoidal lobe, hence we are not surprised to observe that epileptics show frequently symptoms of violent mania, kleptomania, and lastly bulimia or voracious hunger. Ch. Féré wrote recently on this latter symptom.—("La Faimvalle Épileptique" in the *Revue de Médecine*, 1899, vol. xix., p. 497.)

The following is an extraordinary case of voracious hunger:

Percy and Laurent cite the case of a Frenchman named Tarrare, who, when a lad, would eat all sorts of odd substances to satisfy his ravenous hunger, with the result that he was frequently seized with colic. No sooner relieved, than he resumed his previous practice. At the age of 17, when he weighed 100 pounds, he would consume 25 pounds of beef daily. When in the army he would often devour his comrades' rations besides his own. When they guarded themselves,

Tarrare was nearly famished, and had to go to the hospital. There they had to grant him a quadruple allowance, and yet he ate the refuse of the kitchen as well, and sometimes would swallow the poultices and anything else that came in his way. He was reported to have eaten dogs and cats, and of once having eaten the dinner of 15 labourers. He was utilised by the officers of his regiment for comical adventures, but gradually the novelty wore off. He lived a little while on what food he could steal from poultry yards and elsewhere, but in the end returned to the hospital. There he was discovered to have eaten the flesh of dead bodies, and when once the dead body of a little girl had mysteriously disappeared he was suspected of it and dismissed from the hospital. He turned up again at the Hôpital de Versailles, where he died shortly afterwards of purulent diarrhœa, at the age of 26.—(*Dictionnaire des Sciences Médicales.* Article, "Homophage," man-eating.)

Annales de la Médecine Physiologique, October, 1832. —A woman of the name of Denise furnished a curious example of insatiable appetite for food. In infancy she exhausted the milk of all her nurses, and ate four times more than other children of the same age. At school she devoured the bread of all the other scholars. And in the Salpêtrière Hospital it was found impossible to satisfy her habitual appetite with less than 8 or 10 pounds of bread daily. Nevertheless, she there experienced, two or three times a month, violent attacks of hunger, during which she devoured 24 pounds of bread. If, during these fits, any obstacle was opposed to the gratification of her imperious desire, she became so furious that she used to bite her clothes, and even her hands, and did not recover her reason till hunger

was completely satisfied. On one occasion she drank the soup prepared for twenty persons, along with 12 pounds of bread. On another occasion she drank all the coffee prepared for 75 of her companions in the Salpêtrière. *The anterior part of both temporal lobes was abnormally developed.*

F. Lallemand.—Joseph Prévot, 40 years of age, after a severe blow on the left temple, felt pain in both right and left temporal regions and became violently maniacal and destructive. When recovering from his maniacal delirium and after a sound sleep of 48 hours' duration, he had an immense appetite and drank with avidity. Five days afterwards sudden fever set in and he died.

Post-mortem.—Fracture and caries of petrous bone; encysted hæmorrhagic focus in the left temporal lobe; lateral ventricles dilated to double their size.—(*Recherches Anatomico-pathologiques sur l'Encéphale*, Paris, 1830.)

M. Falret.—Marie Motheau, aged 78 years, in whom was found, post-mortem, a tumour in the sella turcica, compressing temporal lobe, suffered a maniacal excitement. She was eating continually, though bread was sufficiently good for her. She came to the infirmary because of her vomiting and diarrhœa, which were thought to be due to her gluttony.—(*Bulletins de la Société Anatomique de Paris*, 1866, vol. xli.)

E. F. Brodie has recorded an interesting case of **bullet wound of the anterior tip of the temporal lobe.** A man, aged 22, received a wound of the cranium from a pistol ball. The ball, which weighed half an ounce, entered at the supra-orbital foramen, fractured the orbital roof and temporal fossa, passed beneath the integument to a point $2\frac{1}{4}$ inches above the external auditory meatus and out, dividing the posterior branch of the temporal artery. Several spiculæ of bone were removed, and about half an ounce of cerebral tissue issued from the point of entrance. The patient was semi-comatose for about five days. On the tenth day, having been kept on low diet, he became so excessively hungry that his friends imprudently allowed him to eat bread and bacon, smoke a cigar, "and enjoy a convivial round generally," during which his outraged system revolted. He had hæmorrhage from the posterior branch of the temporal artery to the extent of five quarts, releasing four days later, after some suppuration, a scale of lead weighing 28 grains, and leading to recovery in six weeks' time.—(*American Practitioner*, January, 1880.)

Wernicke and Friedländer.—A case of gummatous softening of both temporo-sphenoidal lobes involving the corona radiata as well. Patient was deaf, had epileptic convulsions, and **suffered with thirst** so excessively that she drank water by the bucket.—(*Fortschritte der Medizin*, 15th March, 1883, vol. i., p. 177.)

C. P. Johnson.—J. B. L., 21 years of age, previously a teetotaller,

ambitious to cut his name on a steep rock, fell from a height of thirty feet and struck the antero-lateral portion of his skull. Fifteen months later he had the first epileptic convulsions. The attacks generally occurred after imprudence in eating and on mental excitement. Patient sought the advice of Professor Johnson. A dense and depressed cicatrix of the soft tissues extended **from the middle of the temporal bone forward to the side of the forehead.** Suspecting deeper injury Professor Johnson excised the bone corresponding to the cicatrix. Patient had two more attacks within six weeks after the operation ; but none up to the time of the report, four years after the operation ; but patient still indulges in excesses of eating and drinking.—(*The American Journal of Insanity*, January, 1857, vol. vii.)

H. Schüle.—Jacob Hock, 56 years of age, admitted for furious mania with impulses to violence and destruction. Patient developed a tremendous gluttony.

Post-mortem.—Two gummata in the dura mater at the tip of the left temporo-sphenoidal lobe.—(*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874, Case 5.)

R. v. Krafft-Ebing.—O. D., 39 years of age, labourer, single, hitherto healthy, had a fall over a staircase, in which he knocked his head immediately over the right ear, so hard that he remained unconscious for some time. Besides the swelling of the part there were no signs or symptoms, and patient quickly recovered. Soon, however, he developed two morbid tendencies, kleptomania and voraciousness, for which he was sent to the asylum two years later.—(*Über die durch Gehirnerschütterung und Kopfverletzung hervorgerufenen psychischen Krankheiten.* Erlangen, 1868, Case 2.)

Landerer and Lutz.—Case 26, with very violent mania and **bulimia** most pronounced.

Post-mortem.—Dilatation of ventricles compressing temporal lobes.—(*Report of Private Asylum "Christophsbad" in Göppingen*, 1878.)

Dr. Bleynie.—Monin, 55 years of age, became suddenly violently maniacal. On admission a voracious appetite was observed. He died suddenly.

Post-mortem.—There was an abscess in the temporo-sphenoidal lobe. Brain otherwise healthy.—(*Dissertation sur l'Inflammation du Cerveau*, 1809.)

Edward G. Levinge.—J. P., aged 60, a demented patient, who crammed the food ravenously into his mouth, unless fed.

Post-mortem.—There was an encrusted hæmorrhage in the left temporo-sphenoidal lobe.—(*British Medical Journal*, 13th July, 1878.)

Sir James Crichton-Browne.—An epileptic woman, 54 years of age, who suffered from violent maniacal excitement, and in whom, post-mortem, was found a cancerous tumour in the right temporo-sphenoidal lobe. Her appetite for food was at times voracious.—(*Ibidem*, 26th April, 1873.)

Thomas Smith.—*Delusion about Food.*—A person of education and

some acquirements, aged 35, was brought into St. Bartholomew's Hospital within half an hour of having made an attempt on his own life with a revolver. There was a wound in the fore-part of the right temple, from which blood was flowing freely. In the left temple, the bullet could be felt. The patient was conscious and spoke sensibly. The first day he was very restless, and could with difficulty be kept in bed. The second day he was unable to see on account of the swelling about the orbits, and imagined himself in an hotel ; he ordered various delicacies of the "waiter."—(*Lancet*, 3rd May, 1879.)

Dr. Monro.—A case of voracity, in which the brain was found, after death, to be extensively diseased, while no morbid appearance whatever was found in the stomach or intestines. Patient ate voraciously, but used to vomit up the greater part of it.—(*Morbid Anatomy of the Gullet, Stomach, and Intestines*, 2nd edition, p, 271.)

Dr. Mortimer relates the case of a boy of 12, who swallowed in six consecutive days 384 lbs. of food, being on an average 64 lbs. daily. When food was withheld from him he used to gnaw his own flesh. During his waking hours he was continually eating. This morbid condition lasted for a year.—(*Philosophical Transactions*, vol. xliii., p. 366.)

J. Haslam reports the case of a girl, aged $3\frac{1}{4}$ years, who had become mad at $2\frac{1}{2}$ years of age, after inoculation for small-pox. This creature struggled to get hold of everything which she saw, and cried, bit, and kicked if she was disappointed. Her appetite was voracious, and she would devour any sort of food without discrimination ; she would rake out the fire with her fingers, and seemed unconscious that she had been burnt. She could not be taught anything, and never improved.

The Phrenological Journal, Edinburgh, vol. vii., 1832, p. 64.—D. M., patient at Royal Infirmary, Edinburgh, an epileptic who "ate continually." He complained of dying of hunger, and when roused from stupor and even in his delirium had only one idea to which he gave expression. It was "hunger," "hunger." His stomach was overdistended though not painful or tender. Patient complained of headache, the pain arising at a tender spot in front of the right ear.

Kenneth M'Leod.—W. L., stone-quarrier, suffering with violent mania after an apoplectiform attack. His appetite was voracious, and he was not by any means particular as to what he ate.

Post-mortem.—Both lateral ventricles were excessively dilated, flattening the temporal convolutions.—(*Journal of Medical Science*, 1861, vol. vii., Case 1.)

S. W. D. Williams.—F. O., single, female, aged 27, suffering from violent mania, ate with avidity all that was given to her, though she brought up nearly all she took.

Post-mortem.—There was a gumma in the temporal lobe close to the Sylvian fissure opposite the island of Reil, and the whole temporal lobe was firmly adherent to the bone.—(*Ibidem*, April 1869, vol. xv.)

Bonville Bradley Fox.—K., aged 49, fell from a trap and injured the left side of his head, a scar being visible from the sagittal suture to the temple. Irascibility and tendency to assault innocent persons, after

the accident. When he ate, he did so ravenously.—(*Ibidem*, July, 1891, vol. xxxvii., Case 2.)

William Julius Mickle.—J. W. T., aged 47, sustained a severe blow on the head by a stone, which struck him in front and slightly above the left ear. Besides violence and kleptomania, he showed an increase of appetite. Previous to the accident he had always been a small eater, taking scarcely sufficient to keep up strength.

Post-mortem.—The temporal convolutions showed adhesion and decortication. —(*Ibidem*, October, 1885, Case 2.)

H. Voppel.—Patient, 47 years of age, destructive and voracious, had a small head with bulging temporal bones.—(*Allg. Zeitschrift für Psychiatrie*, 1857, vol. xiv., Case 2.)

The same Author.—Patient, 30 years of age, with a similar broad head, aggressive, biting, striking, and voracious.—(*Ibidem*, Case 15.)

N. Friedreich.—Sabine Horn, 44 years of age, violent and destructive. Enormous appetite, demanded food all day, and swallowed greedily all she could get.

Post-mortem.—Tumour of the thalamus compressing right temporal lobe.—("On Intracranial Tumours," Würzburg, 1853.)

Gustav Spies.—Margarite L., 36 years of age, married, after knocking her head against a stone one night in the dark, became furious, raging, aggressive, and voracious. In another week she developed sitophobia. Died in an attack of mania furiosa.

Post-mortem.—Hæmorrhage in both middle fossæ more so in the right. Adhesion of the dura to the base of the skull.—(*Zur Casuistik der traumatischen Manie*, Würzburg, 1869.)

Transactions of the Clinical Society of London, vol. xxx., 1897. "On Cases of Voracious Hunger and Thirst from Injury or Disease of the Brain."

By **Mr. Stephen Paget.**—Case of a boy, 12 years old, with an abscess in the left temporo-sphenoidal region. The patient was twice trephined. Three days after the first operation the notes say: "His appetite is remarkable; he begs for solid food, and says 'I want to go home; they don't give me enough to eat here.'" Two days later the notes say: "Restless and noisy, appetite ravenous." At this time he had partial aphasia. He slowly recovered. Even when he was at his worst—delirious, lying in a state of stupor, or screaming wildly—he would eat and drink greedily, taking more food than any man in the ward, asking for more, and saying, "What 's the good of that to me?"

Case of **Mr. W. H. Bennett,** related by Mr. Paget.—A man, 22 years old, was struck with a hockey stick on the left side of his head and was unconscious for about a quarter of an hour. About a month after the injury he began to have a voracious appetite for solid food; he would eat a whole chicken at one meal, and on one occasion ate twelve

large slices of meat for lunch, besides vegetables, sweets, etc. He had no excess of thirst. This abnormal hunger lasted over a year, and the appetite has not yet quite come back to normal.

Case from the private practice of **Sir Thomas Smith,** and related by Mr. Stephen Paget.—A young man, 20 years old, subject to a chronic discharge from the ear, received a violent blow on the head by coming into collision with another man in a swimming-bath. The accident was followed by acute fever, with aggravations of the disease of the ear, and with signs of thrombosis of the lateral sinus and the internal jugular vein. Operation showed a suppurating cavity in the petrous bone, containing dermoid substance. From the outset of his acute symptoms the patient had been subject to a voracious appetite, and this continued after the operation. He would eat one plateful of meat after another, and would wake during the night with hunger. His appetite was always appeased by food, but it did not return to normal till three weeks after the operation.

Case from the private practice of **Sir Thomas Smith,** and related by Mr. Stephen Paget.—A man, 32 years old, fell from his horse, and presented the signs of a fracture of the base of the skull. He recovered, and in a month was able to get about. A note of his case, about three months and a half after the accident, says : " At the present time he has only slight headache, and sometimes slight giddiness. Ever since the accident he has been very thirsty, and he had at first a voracious appetite. Now his hunger is much less, and his thirst continues." The urine contained neither sugar nor albumen.

Putawski, *Lancet*, 1890, quoted by Mr. Stephen Paget.—A young man fell out of a waggon and struck his head against a stone. He was at once admitted to hospital, unconscious, and bleeding from left ear. For the first three days he was now drowsy, now delirious. The diagnosis was fracture of petrous portion of temporal bone. On the fifth day he regained consciousness, and at the same time became inordinately hungry ; the usual diet wholly failed to satisfy him. He constantly complained of hunger, and even cried for food. Six pounds of bread daily, besides other articles of diet, were not enough for him. The bowels acted regularly. There was no excessive thirst ; the daily quantity of urine varied from two and a half to three pints. After ten weeks his appetite fell to normal.

Nothnagel, Virchow's *Archiv*, 1887, quoted by Mr. Stephen Paget.—A man, aged 35, in consequence of a kick by a horse fell and came down with his right ear against a piece of wood. He was stunned, and unable to rise. Half an hour later he felt great thirst, and drank more than five pints in the next three hours, before admission to hospital. He was still suffering from thirst a fortnight after the accident when he left the hospital at his own request. The accident occurred between 7 and 8 o'clock in the evening, and he first passed water after it about 11 o'clock, having already drunk five pints of fluid. Next day he drank 21½ pints, the day after 32½ pints ; on the seventh day 28 pints, on the eleventh day 30½ pints. A few days later, when he left hospital,

his average had fallen to 9 pints. There was no dryness of the mouth or fauces, and the skin acted freely. The urine was always clear, pale, acid, free from sugar or albumen.

Archives Générales de Médecine, 1860, quoted by Mr. Stephen Paget. —A man fell from a high scaffold, and was at once admitted to hospital. Besides other injuries he had a contused wound of the right side of the forehead, and hæmorrhage from the left ear. When he recovered consciousness after five days he was agitated, and constantly asked for food and drink. He drank daily from 7 to 12 pints; he would call at the top of his voice for food and drink, and on one occasion he drank 24½ pints in one day. After some weeks his thirst slowly abated, and he left the hospital, in good health, eight weeks after admission.

Rosenthal, *Über Magen-Neurosen*, Vienna, 1886, quoted by Mr. Stephen Paget.—A young woman, 24 years old, was knocked down and fell with her head against a step (presumably injured her temple in front of ear). She was ill for about a week. Then she began to have a voracious appetite, so that she would not leave the house, even to go a short distance, without taking a supply of food in her pocket. This abnormal hunger lasted for about three months, varying from time to time in its intensity.

Baudin, *Revue Générale de Médicine*, 1860, quoted by Mr. Stephen Paget.—A young man, 18 years old, working in a saw-mill, was struck with a piece of wood on the right side of the forehead, and was unconscious for some hours; then came violent headache, fever, shivering, and intense thirst. Two days later he was well enough to go back to work, but his thirst persisted, and three weeks later he came back to hospital, begging to get relief from it. He was in good general health, his appetite for solid food was not excessive, he complained of nothing but extreme thirst, drinking all day, and waking at night again and again to drink. On one occasion, in twenty-four hours he drank no less than 52½ pints. His urine was almost pure water, and did not contain any trace of sugar. He was healed with large doses of valerian, and in three weeks his thirst was much abated, and was daily getting less.

Discussion on Mr. Stephen Paget's paper on "Voracious Hunger and Thirst after Injury or Disease of the Temporo-sphenoidal Lobe."—(*British Medical Journal*, 1897, vol. i., p. 461.):

Mr. F. C. Wallis recalled the case of a boy with temporo-sphenoidal abscess, which was tapped, and he afterwards had a voracious appetite. He would steal other patients' crusts, and howl if his own plate was removed.

Dr. W. S. Colman.—Voracity was a common symptom after an epileptic fit, though it generally soon passed off.

Dr. Kingston Fowler mentioned the case of a boy in Middlesex Hospital with non-purulent discharge from the right ear, cerebral vomiting, deafness, and double optic neuritis, who was constantly yawning, and had an enormous appetite, eating three breakfasts, and other meals in proportion. He probably had a quiescent abscess of the temporo-sphenoidal lobe.

Mr. T. Smith opened an abscess in the temporo-sphenoidal lobe in a patient at St. Bartholomew's Hospital — in addition to the two cases of his mentioned by Mr. Paget. The patient afterwards had a great appetite. The cases showed the stimulus of a function, not its absence. The patients apparently possessed an ability to dispose of the food taken, for in spite of eating ten times as much as usual they yet had no dyspepsia nor other abdominal discomfort.

Dr. Thomas Buzzard said: *Physicians were prone not to see what they did not look for. Now they would look for these cases and probably find them.* He thought there was ground for locating the "hunger and thirst" centre in the temporo-sphenoidal lobe. He supposed it would be through the vagus nerve and its cerebral roots that the phenomenon would be produced, and those roots might be in the temporo-sphenoidal lobe.

CHAPTER V

THE LOCALISATION OF SPECIAL MEMORIES

1. For Words.

   The speech-centre—History of its discovery—Gall *versus* Broca —Proof of Gall having located it in the third frontal convolution.

2. For Music.

   Thirty cases of localised brain-lesion.

3. For Numbers.

   Thirty cases of localised brain-lesion — The visual memory for numbers—Arithmomania—History of arithmetical prodigies.

4. Other special Memories.

   Eight cases of localised brain-lesion identical with the localisation of phrenologists — Loss of memory of previous events, of forms, objects, places—Loss of sense of time—Idiot savants.

5. Colour-blindness.

   Localised lesion found in Dr. Dalton.

6. Conclusions.

CHAPTER V

THE LOCALISATION OF SPECIAL MEMORIES

1. The Speech-Centre

SO great has been the prejudice of anatomists and physiologists against Gall that not one of them has over opened Gall's large work on the brain, or even the volume of brain engravings, which display a perfection of finish rarely equalled. It is only charitable to assume neglect, otherwise a motive less worthy would have to be urged to account for this ignoring of Gall's discoveries. Had physiologists but opened the work, they would have discovered that *Gall located the speech-centre in the third frontal convolution* at its basal extremity. "The cerebral region resting in the posterior half of the roof of the orbit between XV (anterior border of third frontal convolution) and 39 (at posterior border thereof, abutting on the fissure of Sylvius) is the organ of the memory of words" (Gall). His disciple, Spurzheim, placed the organ exactly in the same locality.

Some opponents are fond of telling the story that Gall located the speech-centre in the eye, because of the observation that those who have an excellent verbal memory have ox-eyes. Why would they never look into Gall's great work, but content themselves with the

cheap busts and pamphlets of some itinerant phrenologist. There are more people who know Newton's story of the apple, than there are people who know the law of gravitation.

We are in the habit of attributing this discovery to Broca, because he is said to have supplied the pathological cases. Had we not plugged our ears and shut our eyes in horror at the word "phrenology," we should have come across a number of cases of aphasia, after injury or disease, in the phrenological literature.

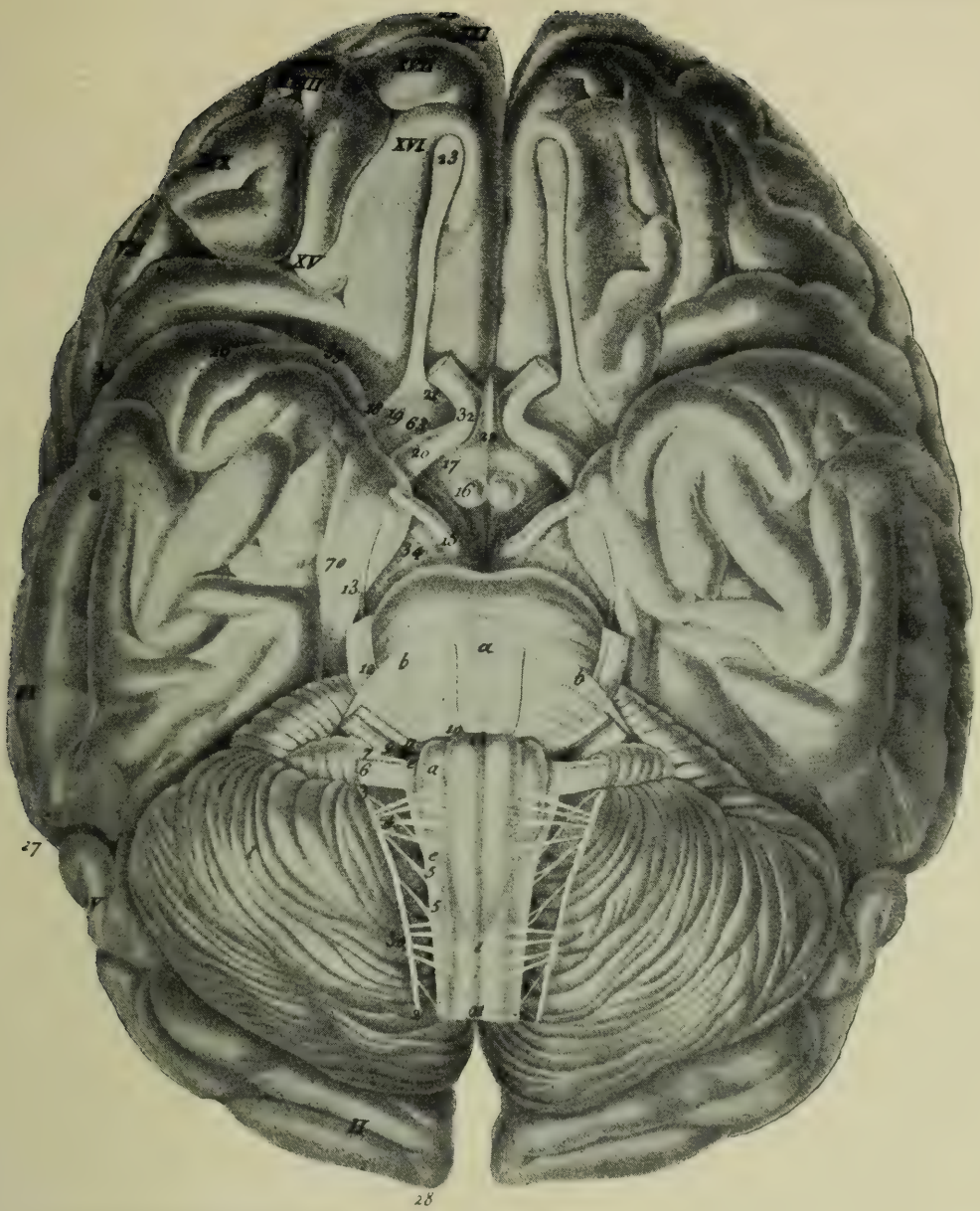
Here is the first case of "Aphasia," or Loss of Speech, recorded by Gall, nearly a Century Ago.

"Edward de Rampau, aged 26, received from a foil, the point of which had been broken on the cushion, a blow on the middle part of the left canine region, near the nostril, in a direction oblique from below upward, and slightly so from without inwards. The instrument penetrated to the depth of about $3\frac{1}{3}$ inches, across the left nasal fossa, crossed the cribriform plate of the ethmoid near the insertion of the falx cerebri, and appears to have penetrated, in a vertical direction and somewhat obliquely from before backward, to the depth of five or six lines in the internal posterior part of the anterior left lobe of the brain, in such a manner as to approach the anterior part of the temporal lobe.

"The patient experienced a very considerable hæmorrhage at the instant of being wounded, and a large quantity of splinters escaped through the nose and mouth. Patient lost the sight of the left eye for a month, and subsequently saw all objects double. The sense of smell was temporarily extinguished. The taste was equally destroyed. It returned by degrees on the right side of the tongue, but not on the left. The whole of the tongue was drawn to the right in opposition to the hemiplegia, which existed on the right side; the mouth being drawn to the left. The sensibility remained unaffected.

"The memory of names was wholly extinguished, while the memory of objects, which could be demonstrated to him was perfectly sound. Patient, though knowing the physician well and recognising him, could not recall his name, and always designated him as Mr. 'Such-a-one.'"

Dr. W. A. Browne, Sir James Crichton-Browne's father, contributed several cases of aphasia to the *Edinburgh Phrenological Journal*, as early as 1834, and it is quite amusing now to read a case of aphasia



From Gall's Atlas, 1809 (*reduced*).

BASE OF BRAIN.

Gall.—" I regard as the organ of **verbal memory** that cerebral part which rests on the posterior half of the orbital plate, between XV and 39 " (Fissure of Sylvius).

See also Plates IX. and X.

recorded in the *Lancet*, 1st February, 1824, where the author had to argue with all his might that the loss of speech in the case quoted was not due to any injury to the vocal organs or tongue, but was a lesion of the brain. He quoted cases of injury to the former organs in which the patient was still able to speak, though imperfectly.

Broca located the speech-centre at the posterior extremity of the third frontal convolution, corresponding to Gall's location of the "faculty of imagination" termed by Spurzheim "Ideality," hence Broca was right in saying that his centre was not so much an organ of articulate speech as an organ to form the higher conceptions and ideas which can be only acquired through language. Broca, later, enlarged the speech area, and Naumyn (Medical Congress at Wiesbaden, 1897) declared the speech-centre to reach to the base of the third frontal convolution (Gall's area), and Flechsig regards the island of Reil as the association-centre of speech.

Sir James Crichton Browne is reported to have said at the Bradford meeting of the British Association for the Advancement of Science, in 1873: "Ferrier locates the 'memory for words' in the very part indicated by the phrenologists as 'the organ of language.'"

Though physiologists and pathologists would reject the suggestion with the utmost indignation that they admitted prominences or bumps in the skull or brain, they are nevertheless in the habit, when the opportunity occurs, to observe abnormal developments of such centres as they do admit to exist. Thus Mathias Duval says of Gambetta: What person has ever been a greater orator and improviser of speeches? In him the third left frontal convolution was enormously developed.—(*L'Aphasie depuis Broca*, Paris, 1888.)

To show how dead-set was the opposition to Gall's discovery, it is expedient to quote an incident referring to the discovery and subsequent acknowledgment of the localisation of the speech-centre. The facts I have obtained from the report of the discussion which took place in the Imperial Academy of Medicine of France, at the sitting of 6th December, 1864.

As I have said, Gall was the discoverer of "the speech-centre," and he himself, and Bouillaud, Dax père, and Dax fils, after him, collected cases of aphasia, or loss of speech. There was violent opposition at the time against all localisation, Leuret and Lelut were two of the chief opponents, until Broca succeeded in overcoming this opposition, and to him the credit was assigned of having been the discoverer of this particular centre. G. Dax had sent in a treatise entitled : "Observations Tending to Prove the Constant Coincidence of Speech-Disorders, with Lesions of the Left Hemisphere." The Academy charged Bouillaud, Becland, and Gall's opponent, *i. e.*, Lelut, to report upon it.

Dr. Lelut said he regretted that the Academy had imposed on him this task, which he ought to have declined. There are many points in physio-psychological science on which he was quite ready to modify his opinion, but there are some points on which his opinions never could be changed or modified. Among these are the relations which it is attempted to establish between certain mental faculties and certain parts of the nervous centre, and *amongst these the attribution of the faculty of language to a particular part of the nervous system.* This is neither more nor less than phrenology, and he had paid too much attention to this pseudo-science to have recourse to it. Such being the case, he would only speak

in his own name, leaving it to his colleagues to express their own opinions separately. Dr. Dax, it appears, had collected about 140 cases, in which speech disorders were always found connected with some lesion of the left hemisphere; the lesions of the right hemisphere producing no disorders of this kind. *If such a fact were true, then the brain—that mysterious organ—would be still more mysterious.* Dr. Lelut concluded by citing what he called a truly startling fact, that of an epileptic in whom the left hemisphere was reduced to a pulpy mass, yet whose speech was free to the moment of death.

Dr. G. Dax referred in his *Mémoire* to a treatise written by his father, Dr. Marc Dax, and read before the Medical Congress held at Montpellier in the year 1836. The father referred to the left hemisphere of the brain, but the son limited the lesion in loss of articulate speech to the region adjoining the insula, and to the posterior part of the third frontal convolution.

Sir Samuel Wilks, M.D., late President of the Royal College of Physicians: *On Gall's Discovery of Aphasia and the Seat of Language:*

"It is well known that Gall was first impelled to the study of phrenology by having observed, whilst at college, the great differences in the mental faculties of his fellow-students and the association of those faculties, as he thought, with peculiar conformations of the head. His first observations had reference to the different degrees of facility with which they acquired languages, and this aptness he connected with prominence of the eyes; he was thus led to place the organ of language over the eye. Whatever amount of truth there may be in the phrenological doctrine, it is remarkable that Gall was right in placing the seat of language in that neighbourhood, for numerous instances of disease and injury

speedily came before him and his followers, by which the whole system of phrenology seemed to be established. The doctrine was thus expressed: 'The power by which we employ signs to represent our ideas and feelings is connected, not merely with the anterior lobes of the brain, but with that portion of these lobes which rests on the centre of the orbital plate,' or in the words of Gall himself, which are not exactly similar, 'the manifestation of verbal language depends on a cerebral organ, and this cerebral organ lies on the posterior part of the superior orbital plate.'

"In whatever way we may regard the first inquiries of Gall, it is interesting to see with what enthusiasm the phrenologists set about proving their doctrine as to the seat of language. The earlier volumes of their 'Transactions' contain numerous cases of aphasia connected with disease of the brain, which, no doubt, involved the third anterior convolution. *The description of these cases is most excellent, and the aphasic condition seems so perfectly understood, that it is really surprising why all that is known about it nowadays should not have been taught equally well fifty years ago.* Our works on physiology, strangely enough, were silent on the subject of speech in connection with any localised seat in the brain, while a heterodox literature contained the whole of the facts which have only just now been taught in the schools.

"*One can only account for the ignorance of physiologists and the medical profession of well-established doctrines by their antipathy towards the phrenological school, which prevented any of its literature entering the portals of our college libraries.*

"As most modern writings on aphasia entirely exclude the work performed by phrenologists, although

done anterior to that usually quoted, I will offer the notes of some cases taken from their 'Reports and Transactions.'" Here follow the notes.—(*Guy's Hospital Reports*, 1879, vol. xxiv.)

2. The Brain-Centre for Music

GALL.—On the Brain-Centre for the Appreciation of the Relation of Tones (*sens des rapports des tons*)—"Why seek in the brain an organ of music? To be apt for music, nothing is requisite but an ear; so say the physiologists; so says the public. . . ."

"ASTLEY COOPER speaks of a man who was very deaf from his childhood, and who, notwithstanding, appreciated harmony; this person played well on the flute, and performed with great success in concerts. DARWIN knew a child who loved music extremely, who easily retained an air after hearing it sung distinctly, and whose organ of hearing was yet so imperfect that it was necessary to speak very loud in addressing him. . . ."

"I applied myself to observing the heads of musicians. It was not difficult for me, at Vienna, to observe a great number of musicians, among whom were some of the highest merit. I moulded the heads of several of them, in order to make these comparisons more easily. I finally succeeded in discovering a region in which all musicians endowed with inventive genius have a prominent projection, produced by the subjacent cerebral mass. The better to establish my discovery, I endeavoured to ascertain the counter-proof. I observed children and adults who manifested no taste for music; some of whom, in fact, gave evidence of antipathy to it. In all these individuals I found the same region of the brain absolutely flat. Finally, I procured for myself the skulls of some great musicians."

The following casts, taken from living heads—all contemporaries—were in Gall's collection: Beethoven, Mozart, Haydn, Gluck, Liszt, Kreibig (the accompanist of Emperor Josef II.), Marchesi, Catalani, Rossini, and numerous others, whose names would not be known at the present day, except by persons intimately acquainted with the history of music. Gall analysed the history of Handel, Mozart, and other musical prodigies; described the musical disposition as it exists sometimes in idiots and the insane, and examined the differences in brain-structure of singing and ordinary birds.

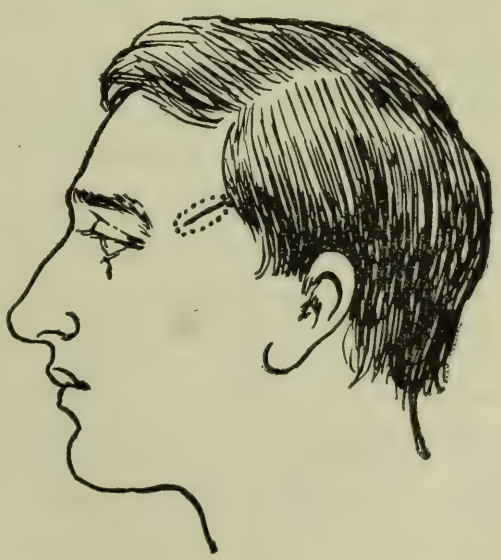
In his *Atlas of Brain Plates*, the centre for *the appreciation of the relation of tones is placed over the fissure of Sylvius*, in the upper and lateral part of the forehead, in the temporal region almost bordering on the supra-orbital ridge, which part, when prominent as in musicians, appears broader than the inferior part of the forehead between the external angles of the eyes.

How correct Gall was in recognising singing-birds by the shape of the head is related by Prince Metternich, the famous Chancellor and lifelong patron of Gall, who used to accompany him to the Central Market in Vienna for the selection of singing-birds. To illustrate Gall's capacity, I would mention also that in the Paris collection there is a mask of Liszt labelled by Gall: "Liszt. A mask taken from the living head. A young Hungarian who very early displayed a great talent for music, and cultivated it with

enthusiasm. The formation of the tone-centre is very striking in the mask." Now, Gall's successor, Dr. Fossati, who had also examined Liszt's head, is reported in the *Lancet*, 1834, p. 898, to have said that, "although the shape of the forehead of Liszt has some analogy with that of Weber, yet he feared this young artist, with all his talent, was not capable of producing anything to be compared with works of a higher worth." We, who have known Liszt in his later days, can certify that this prognosis, given by the phrenologist when Liszt was still a youth, proved quite correct. Liszt remained one of the best of performers, but his compositions were of minor value.

The next record I have come across is that, on August the 6th, 1825, George Douglas Cameron, Esq., M.D., of Liverpool, presented a cast of the head of a blind girl to the Phrenological Society of Edinburgh, to illustrate a deficiency of the appreciation of music. All kinds of music were as a simple noise to her, and her teacher, in sheer despair, gave up teaching her music.

Another medical man, Dr. G. A. Königsfeld of Aix-la-Chapelle, records the following case:



J. Trump, a singer, 18 years of age, received a kick from a horse, resulting in a fissured fracture of the frontal bone, the fissure running from the outer corner of the left eyebrow upwards along the border line of forehead and temple. The particles of bone were pressing on the brain, and the brain itself was contused. The wound suppurated, but got well after surgical treatment, a broad deep scar being left. The patient had not suffered in intelligence after his recovery, but lost the memory

of all the tunes he formerly knew.—(*Zeitschrift für Phrenologie*, Heidelberg, 1843.)

Let this case be now compared with the one following, which occurred as recently as 1895:

J. G. Edgren.—*A case of temporary paragraphia, temporary word-deafness, permanent tone-deafness.*—The patient, 34 years of age, on the 31st August, 1890, knocked the side of his forehead against a lamp-post so that he fell to the ground. He complained of headache afterwards, of imperfect sight, of vomiting, of difficulty of speech, and abnormality in the sense of taste. At first he could not eat at all. The next few days, he took some water only, because he felt as if all food were remarkably hot; even the water he drank appeared hot. After a week he began to eat, but he now complained that all the food was too much salted.

On the 17th September, patient came home after a visit to several concert places, and declared he could not make out the music. He tried several places intentionally, but though he could hear the music at each concert hall, it did not sound as usual, but more like an indefinite noise, so that he could not make out the melody. The reply his wife gave him he could not understand, and he himself spoke no more for two days. On the 20th September he began to speak again, but in so confused and disconnected a manner, that it was almost impossible to understand him. Admission on the 23rd September. He was word-deaf. He could hear when some one was speaking to him, but without understanding the words spoken. Written communications he apprehended immediately, and he could still calculate. He heard equally well on both sides: he could hear the ticking of a watch at 7 cm. distance. His sense of smell was reduced; he could not smell

spirits or vinegar. On the 5th October his senses of smell and taste were perfectly normal. His defects were therefore only temporary, with the exception of his tone-deafness. He left the hospital on the 3rd of November. Before the accident he had a good musical ear, which had now vanished, so that orchestral music was to him mere noise, and he could not distinguish a waltz from a polka or march. He used to sing to his children, but now when attempting to do so he failed, and lost the melody. On the 17th of March, 1893, he was readmitted for bronchitis and an eruption of purpura. Intelligence quite normal; no traces of aphasia, no word-deafness, only tone-deafness.

The post-mortem examination revealed destruction of the anterior two-thirds of the first temporal convolution, and the anterior half of the second temporal convolution of the left hemisphere.—(*Deutsche Zeitschrift für Nervenheilkunde*, vol. vi., 1895, p. 41.)

Dr. Bouillaud (editor of *Phrenological Journal*, Paris) had a patient 50 years of age, who had lost the memory for words almost entirely, and he could read and write but very little, yet he composed an original tune, watched carefully when it was played to him, and *sang* the words correctly to the accompaniment; a clear proof of there being separate centres in the brain for speech and music.—(*Bulletins de l'Académie de Médecine*, 1864, vol. xxx., p. 753.)

A. Knoblauch.—Lizette S., a little girl 6 years old, was admitted into the clinical hospital at Heidelberg on February the 8th, 1887. The child, until then quite healthy, and of normal bodily and mental development, and without hereditary predisposition, became ill with scarlatina on the 8th November, 1886. This was followed by nephritis, which, however, disappeared early in December. On the 21st December she was suddenly seized with general convulsions. On the 26th December consciousness slowly returned, but there remained a condition of right hemiplegia with aphasia. In course of time she improved, she became quite conscious, had a good appetite and was cheerful, but the paralysis remained to a slight extent. The child could not speak at all at first. Later on she said "Mamma," and apparently repeated a few words. She could sing the song "Weisst Du wie viel Sternlein stehen," etc., but she could not recite the text of the song, or speak voluntarily single words of the same.

On admission, on 8th February, 1887, the patient was found to be a normally developed, slight, but strong child, with fresh red cheeks, and a lively, restless disposition. Mentally, as far as one can judge, she was

very well developed. As she was aphasic she had to make herself understood by gestures; spontaneously, she only uttered "Mamma." She was able to repeat a few words, but very imperfectly. If one commenced the song "Weisst Du wie viel Sternlein stehen," she sang it with the right melody in an automatic way, being unable either to continue or begin afresh when she once stopped. All the words of the text which she was unable to pronounce spontaneously were, while she sang them, articulated perfectly. The comprehension of spoken language was quite normal. The patient had not yet learned to read or write.

Galvanisation of the head was carried out for some weeks, and the patient was exercised methodically in speaking. Remarkable improvement ensued. On the 21st of February she was able to repeat most words correctly, with considerable trouble, it is true. She could count up to three if some one started her with "one." In the beginning of March she was able to sing the song "Weisst Du wie viel Sternlein stehen" quite alone, and certainly with a much purer intonation than at the beginning of the treatment. On the 8th of March she succeeded for the first time in reciting the text of the song without singing the melody. In the beginning of April the patient had acquired a considerable vocabulary, and she even attempted to form small sentences. In the middle of the same month she could utter almost all words, but could not yet form connected sentences, but she managed to make herself perfectly understood. As the arm had improved considerably at the same time, the patient was discharged from the hospital on the 13th April, 1887.—(*Deutsches Archiv für klinische Medizin*, Leipsic, 1888, vol. xliii., p. 331.)

Dr. Bernard.—A lady, music teacher, 45 years old, had an apoplectic stroke, became hemiplegic on the right side and aphasic, but recovered the powers of speech gradually, though she now expressed herself with difficulty. Yet she sang the tune "La dame blanche vous regarde" with the correct melody, pronouncing every word distinctly, and other tunes besides. She was not word-deaf. She could read a few sentences from a newspaper. She could read the title of music scores, yet not the score itself; she could not read a single note. Of all pieces of music put before her, she read the title, but failed with the notes.

Post-mortem.—A long strip of the convolutions within the fossa Sylvii were found destroyed.—(*De l'Aphasie*, Paris, 1889, p. 108.)

Dr. Bernard gives another case, with the result of the necropsy, of a woman apparently deaf, but in reality only deaf for words spoken (sensory aphasia) and for music played to her (sensory amusia). Neither was more than an indistinct noise to her.—(*Ibidem.*)

Ludwig Bruns showed a brain at a meeting of the German alienists at Hanover on 1st May, 1891, of a musician with sensory aphasia, who had not lost the sense of tune.

The autopsy revealed softening of the first left temporal convolution with the exception of the anterior part.—(*Allg. Zeitschrift für Psychiatrie*, 1892, vol. xlviii.)

Frank Hay described the case of a patient, an epileptic, who became aphasic. Besides the speech, patient who previously was a musician had lost the musical faculty. He could not be induced to sing, though formerly a member of a church choir. His humming and whistling was only a monotone, never a tune.

Autopsy.—The tip of the temporo-sphenoidal lobe was disorganised and exposed a cavity which entered the fissure of Sylvius and partly exposed the insula and anterior extremity of the operculum.—(*Journal of Mental Science*, April, vol. xli.)

A. Kast.—An interesting case of aphasia, with loss of "ear" for music. A youth, aged 15, fell from a cart and struck his head against the wheel. The accident was followed by loss of consciousness which lasted several hours, and on restoration to consciousness it was found that the right side of the body was paralysed, and that, though he seemed to comprehend what was said to him, he could not utter a word. The paralysis slowly disappeared. At the end of two months the aphasia had altered its character. The boy was no longer unable to say some words, but he had completely lost the artistic use of his vocal cords, though prior to the accident he was a distinguished member of a choral society. Thus he sang discordantly and quite out of tune, and could not correctly follow the lead of another singer.

Dr. Finkelnburg gives the case of a professional violin-player, who after an apoplectic stroke lost considerably the memory of names of objects and more so of abstract ideas. He could still play the violin by air as ably as before, but not from notes, which he constantly mistook, nor could he write notes any longer without making mistakes. Another stroke deprived him of speech altogether, of the power of writing, and of the ability to read notes.

Post-mortem.—The cortical layer of the island of Reil and the neighbouring brain-parts were softened.—(*Berliner klinische Wochenschrift*, 1870, p. 450.)

Oppenheim published ten cases of aphasia without amusia. The patients showed complete loss of speech and loss of appreciation of words heard, while the ability to sing remained and to play, as for instance on the violin, with perfect understanding of the notes and melodies.—(*Charité Annalen*, 1888, p. 345.)

v. Frankl Hochwart published similar cases.—(*Deutsche Zeitschrift für Nervenheilkunde*, 1891, vol. i., p. 243.)

Other writers on amusia: Lichtheim, Kahler, Pick, Wernicke, Anton, Larionow.

Cases are on record in which the patients, though "word-blind," still retained the power of reading musical notes.

In other cases there is loss of the visual memory for musical notes, though they can read words. The patient can see the notes as usual, but he has no longer the

faintest idea of their significance. The patient may be able to read the words of a song, but can no longer read the accompanying music.

Similarly there may be deafness for spoken words without deafness for musical tones, or the reverse, or there may be complete deafness for both. The notes are heard, but simply as sounds, without the patient being able to assign to them their position in the musical scale.

That the musical capacity is independent of the speech centre, though their location in the brain is close together, is shown, likewise, by the loss of musical perception and of the ability to sing without the simultaneous loss of speech and the power of understanding spoken words. It is also shown by the fact that infants are sooner able to sing than to speak. That speech is unnecessary for the learning of melodies is evidenced by birds, for instance bullfinches.

Children may sing before they speak. At three months normal children will often manifest great delight at the sound of music, and retain the memory of melodies as early as the first year. This was the case with Dvorák's son.

Memory of tune is a very common faculty among the feeble-minded. They readily acquire simple airs and rarely forget them.

Esquirol called attention to the fact that even idiots without the power of speech can sing.

Wildermuth (*Allg. Zeitschrift für Psychiatrie*, 1889, p. 574) estimated that the musical capabilities are well developed in one-third of even badly speaking idiots, and though first-class musicians predominate amongst normal children, second-, third-, and fourth-class musical capacity existed more frequently amongst idiots.

This remarkable relative development of the musical sense in idiots is the more striking on account of the utter absence of any other evidence of artistic taste. A beautiful landscape or a lovely picture is powerless to move them.

America's most remarkable idiot-savant was "Blind Tom," the world's musical prodigy, who though feeble-minded in other respects, could reproduce musical compositions after hearing them only once.

Dr. Langdon Down had an idiot boy under his care who could tell the time, besides the words and number, of nearly every hymn in *Hymns Ancient and Modern.*

Another boy, under Dr. Down's observation, would, if he went to an opera, carry away a recollection of all the airs, and would hum or sing them correctly.

Dr. Batty Tuke, Jr. (*Journal of Mental Science*, July, 1891), said that in insanity the musical faculty was often the last one to go. He had two lady patients who, though quite incoherent in speech, played with great accuracy on the piano, the one by ear, the other by reading music, although the latter was quite unable to read a book, and had not dressed herself for twenty years.

That amusia may be situated in the anterior part of the first temporo-sphenoidal convolution, in front of Wernicke's area for word-deafness is possible, from Edgren's collection of 52 cases of aphasia without amusia, aphasia with amusia, and pure amusia without aphasia (*Deutsche Zeitschrift für Nervenheilkunde*, 1894). Yet I am more inclined from anatomical reasons to seek *the centre for the appreciation of the relation of tones in the small anterior convolutions within the folds of the fissure of Sylvius* that lie between the

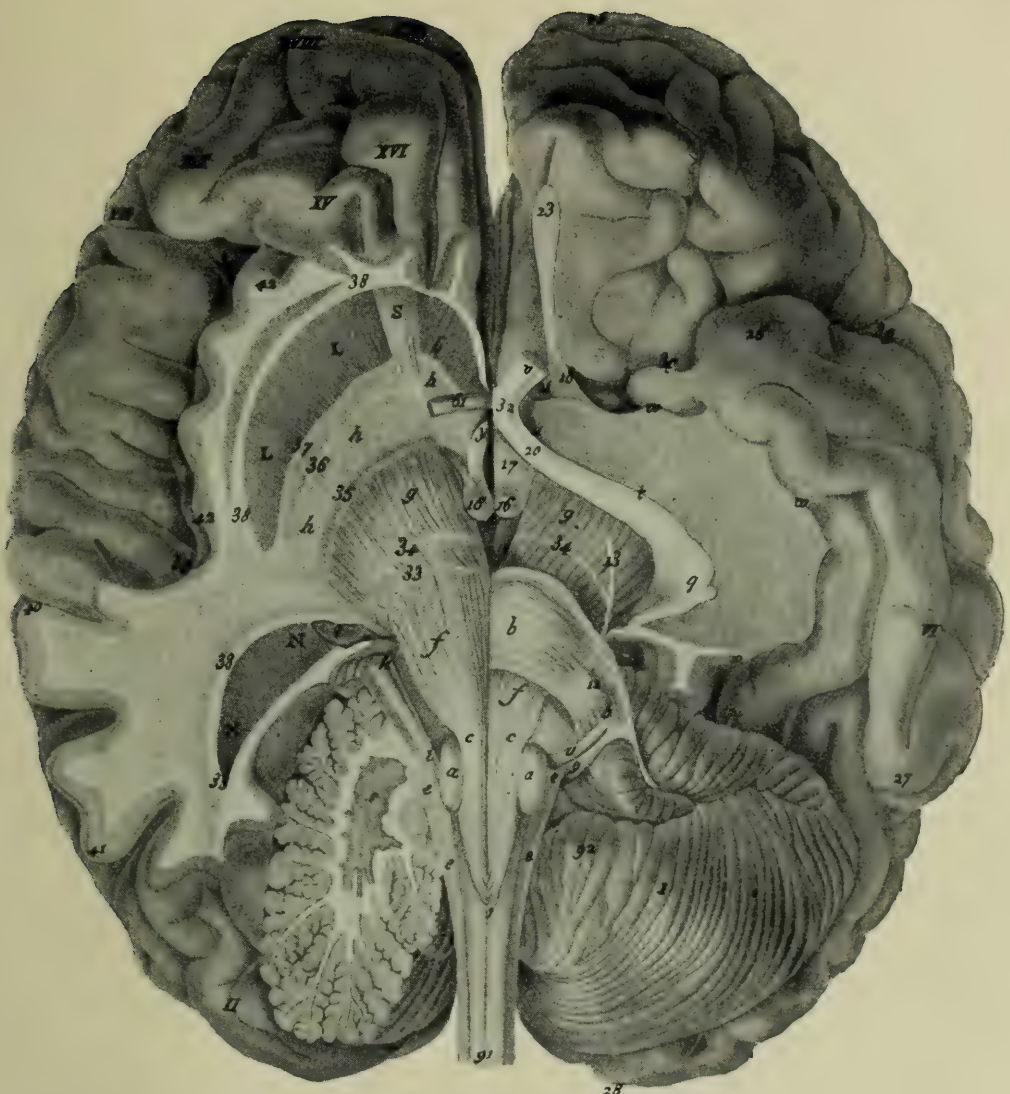
inferior frontal and superior temporal convolutions. Flechsig, possibly guided by Gall's researches, discovered the end stations of the cochlea nerves in this region, and this localisation would also harmonise with Ferrier's observations.

We see, then, that the musical faculty or at least its chief factor, is localisable, and that Gall and his successors discovered a centre for it, which has been confirmed by the modern German School in recent years. Some English alienists (see discussion, *Journal of Mental Science*, October, 1897) do not believe in the localisation of music. Perhaps this evidence will convince them, albeit the result exposes them to the danger of having to accept yet another of Gall's observations as being *correct.*

3. The Memory for Numbers

Gall, after having examined the shape of the heads of some of his contemporary "lightning calculators," as well as of men who had a deficient memory for figures and found mental arithmetic difficult, located *the centre of the sense of "number" at the supra-orbital end of the third frontal convolution* nearest to the external angle of the eye.—(See James Shaw's Case, p. 241.)

A most remarkable event in the history of phrenology is that as recently as last year a neurologist of great standing, Prof. Möbius of Leipsic, has undertaken to re-examine Gall's doctrine as regards the accuracy of the localisation of number, or rather the disposition to mathematics, following Gall's method exactly, that is, the comparison of heads. In a lecture delivered at the fifth meeting of alienists and neurologists of Central Germany, at Leipsic on the 22nd



From Gall's Atlas, 1809 (*reduced*).

Horizontal Section of Brain.

XIX **Memory for numbers.**

See also Plate X., p. 256.

October, 1899, Prof. Möbius declared: "I have not closed the investigation as yet, but I have got far enough to enable me to say with a full conviction, *in this localisation Gall was completely right.* I have found all his statements correct, and only one thing Gall left unmentioned, that the development of the 'mathematical organ' is more often to be observed on the left side."

In the discussion which followed, Flechsig declared that the third frontal convolution is originally divided into four fields, and that perhaps the *lowest* (*No. 40*) *is the one specially developed in mathematicians.* The eminent British colleague who declared his admiration for Flechsig's discoveries at the Royal Institution, while shortly before he denounced phrenology, is probably little aware of Flechsig's strong leaning towards Gall's doctrine, and Flechsig's statement to the contrary is only a subterfuge to hide the truth, knowing well that the present generation of physiologists are profoundly ignorant of Gall's writings.

Arithmetical ability may be hereditary. Dr. Clouston in a discussion on the subject said: The arithmetical power and faculty was absolutely innate in the brain, and they knew that a person who had not begun with being fond of numbers and fond of calculating could not be made a good and ready reckoner.

Dr. Alfred Russell Wallace, in his book upon evolution, devotes a chapter to show that the human capacity for arithmetic could not be explained by any process of development through the struggle for existence, or sexual selection. Yet the arithmetical talent seems to be a special faculty of the human mind. Though all normal children can be taught to count, some learn quickly, others slowly, some become very

expert at figures, others have little aptitude, some men take a delight in working at arithmetical problems, others have a distaste for them.

It often happens that those who are very skilful in solving arithmetical questions have no unusual ability for anything else.

It is curious that in the mental manifestations in idiocy and imbecility we find that of all human faculties that of music is the best preserved, whereas that of number is the most deficient, yet music seems to have a certain connection with number. A tune depends upon the numerical relation of certain notes to one another, and upon their succession in time. Even idiots who cannot speak catch up tunes and hum or grunt them. To be able to learn to speak is a measure in the capacity of imbeciles, but speech may be freely exercised without their being able to count. This deficiency is universal, comprising all classes of imbeciles. The old legal definition of an idiot is "one who cannot count twenty pence."

The greater number of idiots cannot count three, though among imbeciles are found children wonderfully skilled in the arrangement of figures, and in calculations of various sorts.

Dr. Ireland says: "I have seen many imbeciles who understood all the ordinary relations of life, could conduct themselves well in society, go about alone, learn to read, and had quite a respectable amount of general intelligence, who nevertheless could not work with figures, could not give change for a shilling, and could not multiply by two up to twenty without stumbling."

Dr. Shuttleworth says: "Out of 580 imbecile children only 37 were able to work sums; 205 could

not count at all, and another 148 could count only a little. Those children who were reputed to be imbeciles but who were said to have phenomenal powers of calculation, must be children who, during the developmental period, had had certain of their faculties injured by some fever or something that had caused atrophy in a portion of the brain, leaving the arithmetical powers unimpaired. He had, however, in his institution a remarkable case of a young man with a history of congenital imbecility, who was able, without much mental effort, to give the day of the week corresponding to the day of the month for several years past and for several years to come. His ready answers were very surprising to a stranger."

Dr. Langdon Down had under his care a boy, about 12 years of age, who could multiply any three figures with perfect accuracy, and as quickly as he could write the six figures on paper; and yet, so low mentally was he that, although having been for two and a half years in the almost daily habit of seeing Dr. Down and talking to him, he could not tell his name.

In contrast to arithmetical prodigies may be mentioned persons with extreme mental deficiency in the strength of the same mental power.

George Combe states: "Arithmetic has always been a profound mystery to me, and to master the multiplication table an insurmountable task. I could not now tell how much eight times nine are, without going to work circuitously and reaching it by means of the ten, yet for seven years I studied arithmetic. The faculty in me is, in fact, idiotic. Were any other powers in like condition, I should be totally unfit for the ordinary business of life."

One of the most remarkable intellectual defects of

the American Indians is a great difficulty in comprehending anything that belongs to numerical relations.

K. Rieger showed at a meeting of the Medical Association at Würzburg on the 26th February, 1887, a patient, Mr. Seybold, a sculptor, of Carlstadt, who received a fracture of the base of the skull in a railway accident. Patient spoke a bit slowly, and was weaker in his memory than before the accident, but the chief symptom was, that **he had forgotten all ideas of figures beyond 1, 2, and 3.**—(*Centralblatt für Nervenheilkunde*, 1st July, 1887.)

Dr. Volland.—A case of aphasia with complete retention of the power to express figures in words and writing.

A farmer's son, 15 years of age, had a fall which injured the scalp but not the bone. When he recovered consciousness after several days, he understood everything that was said to him, but **could only reply one word, "Anna," by speech or in writing. Yet he was able to count to 100, to recite the multiplication table, and to add or subtract figures.** He could write all figures and calculate correctly on paper. Gradually he acquired the power to speak whole sentences but did not get on well at school, except in arithmetic in which he was equal to the best. Six years after the accident he was still somewhat aphasic, had attacks of giddiness and slight ptosis. This case shows that the formation and expression of words must be anatomically separate from the formation and expression of figures.—(*Münchener medizinische Wochenschrift*, 1886, No. 4.)

J. L. C. Schroeder van der Kolk.—A tradesman came conducted by his son, to obtain the doctor's advice. About half a year back the father had an apoplectic attack of only short duration, and which left behind it no paralysis; yet the memory for names or words had in a great measure vanished, so that he called objects by wrong names, and for example used the word chair when he meant a table. Yet he well knew that the word chair was not the usual one, and he brought forward other words until at last he came to "table," which word he then pronounced with great satisfaction for having found out the right name. But there was yet another remarkable suppression, such as the doctor had not before observed. The patient was no longer able to read, although the sight was not impaired. On a large printed book being placed before the man, he distinguished the letters in it quite well, and spelt, for example, the word "towards," but he was not able to combine these letters into a word. The man had also lost the capability of writing, so that he could no longer sign his name. But the most remarkable circumstance with this patient was, that he could still, according to the assurance of his son, keep his ledger and **reckon** now as ever before.—(*The Pathology and Therapeutics of Mental Disease*, p. 14.)

Dr. Marcé.—*Obs.* 11.—Patient distinguished single letters quite well, but was no longer able to combine them into a word. He transcribed a word quite correctly, but could not write it when it was dictated to him. Yet he could write figures very well.

Obs. 7.—The patient could not write his name from memory, but wrote figures and solved complicated arithmetical exercises, always setting the figures in their proper places.—(*Gazette Médicale de Paris*, 1856.)

James Shaw.—A. G., housewife, aged 46, in feeble physical health, with symptoms of phthisis in an advanced stage, and severe melancholia. No hallucinations. Low-spirited. Memory defective, especially for recent events ; **power of calculation feeble.**

Post-mortem.—Besides a lesion of the parietal lobe there was another superficial patch of yellow softening, measuring about three-quarters of an inch, anteriorly where the third frontal becomes the external orbital.—(*Brain*, vol. v., 1892.)

Otto Hebold.—H. G., a melancholiac who had **loss of speech but could calculate correctly.**—(*Allg. Zeitschrift für Psychiatrie*, 1894, vol. l., Case 2.)

The Visual Memory for Figures

The visual memory for words and letters is completely independent of that for figures. The one form of visual memory may be completely lost, whilst the other remains intact. The visual memory for words may be congenitally defective, whilst that for numbers presents nothing abnormal. Either form of visual memory may be developed to an abnormal degree without the other manifesting any corresponding development, or even with the other remaining below normal.

We are compelled to infer from such complete functional independence of these two groups of visual memories an anatomical independence.

James Hinshelwood.—A man, aged 58 years, a teacher of French and German. Of recent years he has had a large amount of mental work, and before his present visual difficulties appeared he had considerable mental worry (Anxiety—parietal lobe). Patient found suddenly one morning he could not read the exercises as usual. Greatly puzzled he took up a printed book and found that he could not read a single word. On examining his visual acuity Dr. Hinshelwood found

that he was *unable to read even the largest letters* of the test types. He informed him that he could see all the letters plainly and distinctly, but could not say what they were. What attracted special attention was the fact that the patient *read at once the number* standing at the top of each paragraph of the test types. On examining him further with figures it was found that he did not experience the slightest difficulty in reading any number of figures quite fluently and without making any mistakes whatever. He could read figures printed on the same scale as Jaeger No. 1, the smallest of the test types, and from other tests it was evident that there was no lowering of his visual acuity. The inability to read was thus manifestly not due to any failure of visual power, but to a loss of the visual memory for letters. The page of a printed book appeared to him exactly as it appears to a person who has never learned to read. He saw each individual character distinctly enough, but the character was no longer a visual symbol, as he no longer remembered the special significance attached to it. His difficulty with written characters was equally well marked. He could write with perfect fluency and ease to dictation, although afterwards he could not read what he himself had written. He spoke as fluently as ever. He had loss of the right half of each visual field, however; the fundus oculi was normal. Patient was tested further with large combination of figures, and all these were read with the greatest fluency, and without any hesitation whatever.—(*Lancet*, 21st December, 1895.)

A. Chauffard.—Sensory aphasia. Wernicke's area involved. Had a tendency to substitute numerals for words. His appreciation of music was well preserved, though he complained that he could not hear words. —(*Revue de Médecine*, 1881, p. 939.)

Dr. Déjérine had a patient who, although word-blind, could write as

fluently as ever. He could copy correctly pages of manuscript, although *he could not read a word* he had written. He had also lost the power of reading musical notes (note-blindness), but he could still sing well. *He could read figures* and do mental calculations just as well as ever. There was right homonymous hemianopsia. Ten days before his death he was suddenly seized with paraphasia and total agraphia.

Post-mortem.—Old lesion in left temporal lobe, new in left angular and supra-marginal gyri.—(*Comptes-rendus des Séances de la Société de Biologie*, March, 1892.)

Dr. Brandenburg.—A hitherto healthy man, who through a leucoma got blind in the left eye, had an apoplectic stroke, which made him temporarily aphasic. There was alexia but no agraphia ; the patient could write anything but could not read, with the exception of figures, so that the reading of numbers was preserved.—(*Graefe's Archiv für Ophthalmologie*, 1888, vol. xxxiii.)

M. Lannois.—A case of complete loss of all forms of memory except the memory of figures.

Patient, 32 years of age, had been for three years in a condition of complete amnesia, with the exception of the memory for figures. He could not write spontaneously anything except figures, and *calculating remained his only occupation.*—(*Lyon Médicale*, May, 1898, vol. lxxxviii., p. 114.)

Heilly and Chantemesse.—Sensory aphasia. Her power of calculation preserved. Could play écarté correctly. Wernicke's area involved. —(*Progrès Médical*, 1838, vol. xi., p. 22.)

Arithmomania

Trélat (*La folie lucide*) reports a notable example as follows: M. de W. was 45 years old. He lived almost all the time shut up in his room, where he was supposed to be carrying on various studies. He was seldom seen, and when he was seen he complained of headache caused by overwork and the fatigue of his continued night labours. He had an amiable and accomplished wife. People talked to her about the health of her husband and how wrong it was for him to misuse his strength, and begged her to influence him to pursue his studies with less ardour. She answered sadly that all her endeavours were in vain ; but she did nothing to shake the conviction of his friends, although

she knew very well what she had to endure in this difficult position. The poor lady was absorbed by her attempts to maintain the sense and dignity of her husband.

In fact, he employed the whole time passed in his room in counting how often the same letter, *s*, or *t*, or *g*, or *z*, occurs in Genesis, in Exodus, in Leviticus, in Numbers, in Deuteronomy, in the books of Kings, in the books of Chronicles, etc. How many pages in one book began with a *p*, with a *b*, with an *a*; how many ended with *x*, with *c*, etc. (And in those days there were no such magazines as *Tit-Bits*, *Answers*, *Pearson's*, to hold prize competitions for such work.) Other studies of such seriousness as to cause this man of science to pass a fortnight without any attention to his toilette, or even washing himself, consisted in counting all the contradictions he could find in the same author.

Everybody who called on him received the admirable answer, "Monsieur is too busy to be disturbed." Everybody thought that this writer was too modest to publish his book, and would leave behind Titanic works. The poor wife alone contrived to procure for such an utter nonentity, honour and esteem to the last day of his life.

Ludwig Bruns demonstrated at the meeting of the German lunacy specialists at Hanover on 1st May, 1891, a case of arithmomania. The patient was dominated by an irresistible impulse to count everything. —(*Neurologisches Centralblatt*, 1891, p. 349.)

A. Cullere (*Epileptic Arithmomania*) records several cases of epileptics who had a mania for counting, for combining figures of all kinds, especially calculating as regards divisions of time, such as seconds, minutes, hours, days, months, years, and centuries. In one instance, a young man of 27, and a victim to epilepsy, cried out suddenly to the doctor, in the middle of an attack of acute mania, in which he imagined himself surrounded by brigands and assassins: "Shall I tell you how many minutes there are in 100,000 years?"—(*Annales Médico-psychologiques*, January, 1890.)

Arithmetical Prodigies

In the *American Journal of Psychology* we find the following records of arithmetical prodigies:

(1) Nikomachos, of Gerasa, mentioned by Lucianus.

(2) Thomas Fuller, the Virginian calculator; see obituary notice in *Columbian Sentinel of Boston*, 29th December, 1790.

(3) Jedediah Buxton, of Derbyshire, England, 1702–1772; see *Gentleman's Magazine*, 1751, 1753, and 1754, xxi., xxiii., and xxiv., respectively.

(4) André Marie Ampère, living at Marseilles, 1775–1836; see *Revue des Deux Mondes*, 1837, vol. ix., p. 389.

(5) Carl Friedrich Gauss, born 1777 in Brunswick; see *Hänselmann*, C. F. Gauss, Leipsic, 1878. He was not merely a reckoning-machine. His calculating power was only a part of the highest mathematical genius. It is said that a new professor of mathematics at his college handed back to Gauss, then 13 years old, the first mathematical exercise, with the remark that it was unnecessary for such a mathematician to attend his lessons in future. The Grand Duke, hearing of his talent, sent for him. The Court was entertained by the calculations of the boy, but the Duke recognised the genius and accorded him his support. After leaving college, in 1795, he entered the University of Göttingen. In the same year he discovered the method of the least squares, and the year after invented the theory of the division of the circle. In 1801, at the age of 24, his *Disquisitiones Arithmeticæ* were published; the work was quickly recognised as one of the milestones in the history of the theory of numbers. Thenceforth his life was a series of most brilliant discoveries, up to his death at Göttingen, 1855.

Gauss was not only a mathematical genius—he was also an arithmetical prodigy, and that, too, at an age much earlier than any of the others. He was distinguished, from his childhood, for his power of reckoning, and was able to carry on difficult investigations and extensive numerical calculations with incredible ease. His unsurpassed memory for figures set those who met him in astonishment. In mental calculation he was unsurpassed. He had always in his mind the first decimals of all the logarithms, and used them for approximate estimates while calculating mentally. He is distinguished from all other calculators in that during a complicated calculation he continually invented new methods and new artifices.

(6) Richard Whately, Archbishop of Dublin, from 1831–1863, author of numerous religious works, displayed a singular precocity in regard to calculation. "There certainly was something peculiar in my calculating faculty," wrote Whately. "It began to show itself between five and six, and lasted about three years. I soon got to do the most difficult sums, always in my head, for I knew nothing of figures beyond numeration, nor had I any for the different processes I employed. But I believe my sums were chiefly in multiplication, division, and the rule of three. In this last point I believe I surpassed the famous American boy, though I did not, like him, understand the extraction of roots. I did these sums much quicker than any one could upon paper, and I never remember committing the smallest error."

(7) Zerah Colburn, 1804–1840, of whom there exist numerous biographies and accounts in scientific and popular magazines. He visited Faraday in 1816, and explained to him his method of calculation.—(See

Jones's *Life of Faraday*, London, 1870; also R. A. Proctor, *Belgravia*, vol. xxxviii., p. 450; and Carpenter, *Mental Physiology*, chap. 6.)

Colburn was exhibited as an arithmetical prodigy at an early age, though otherwise a backward idiot. When six years old he answered at Boston such questions as "How many seconds are there in 2000 years?" with greater rapidity than they could be solved on paper. The extraction of the roots of exact squares and cubes was done with very little effort. At this time he was unable to read, and ignorant of the name or properties of nine units traced on paper.

The following summer Zerah's father took him to England, and at a meeting of friends he succeeded in raising the number eight to the sixteenth power.

When exhibited in Paris, 1814, and examined by members of the French Institute, among whom was La Place, his calculating power was already on the decline, and before long left him entirely. Gall, who examined the boy without any previous intimation of his character, discovered readily certain peculiarities in the shape of the head (a projecting orbital arch on the sides of the eyebrows) which indicated the presence of a faculty for computation.

(8) Vito Mangiamele, son of a shepherd in Sicily, at the age of 10 years, presented himself before Arago in Paris. He had not received instruction of any kind, yet he solved problems that seemed at first sight to require extensive mathematical knowledge. In the presence of the members of the Academy he found the cube root of 3,796,416 in about half a minute. — (See *Comptes-rendus des Séances de l'Académie des Sciences*, 1837.)

(9) Zacharias Dahse, 1824–1861, of Hamburg (see

Journal für Mathematik, 1844; *Die Gartenlaube*, 1866; *Allgemeine Literatur-Zeitung*, 1861), was born with a natural talent for reckoning. He became acquainted with many learned men, among whom were Gauss, Schumacher, Peterson, and Encke. His powers were greatly developed by practice and industry. Thus Professor Strassnicky of Vienna taught him in 1840 the elements of mathematics, and brought him to such a point that, under the guidance of a good mathematician, he could do exceptional scientific work. In 1847 he reckoned out the natural logarithms (7 places) from 1 to 1,005,000, and in 1850 published the largest hyperbolic table, as regards range, then existing. In 1850 he visited England. Gauss, himself a prodigy, recognised in Dahse a talent for making tables of factors and prime numbers from the 7th to the 10th million, which tables subsequently were published (Hamburg, 1862). He was thus able to turn his only mental ability to the service of science, forming a contrast to Colburn and others who enjoyed even greater advantage, yet failed to yield any results.

Dahse had one ability not present to such a great degree in the other ready reckoners. He could distinguish some thirty objects of a similar nature in a single moment as easily as other people can recognise three or four. The rapidity with which he would name the number of sheep in a herd, of books in a bookcase, of window-panes in a large house, was even more remarkable than the accuracy of his mental calculations.

(10) In 1845 a committee of the Academy of Sciences of Paris investigated the powers of a *child of* $6\frac{1}{2}$ *years*, who possessed an extraordinary aptitude for calculation.

(11) In 1852 the same assembly was called upon to

report on C. Grandmange, an arithmetical prodigy of 16 years of age, who was born without legs or arms.

(12) Henri Mondeux, 1826–1862, was a shepherd at the age of 7, and, deprived of all instruction, he amused himself by counting and arranging pebbles. He used to offer to persons he met to solve certain problems, such as to tell how many hours or minutes were contained in the number of years which expressed their ages. This awakened the interest of Mr. Jacoby, a schoolmaster at Tours, who sought him out. Jacoby proposed several problems and received immediate answers, and, finding that the boy could neither read, write, nor cipher, and that he had no acquaintance with fractions or any of the ordinary rules of arithmetic, he offered to instruct him. In 1845 Jacoby presented the boy to the Academy of Sciences of Paris. A committee made an exhaustive examination of his powers, and reported on the processes used by him. "At present he easily executes in his head not only divers operations of arithmetic, but also in many cases the numerical evolution of equations; he invents processes, sometimes remarkable, to solve various questions which are ordinarily treated with the aid of algebra." That he was something more than a mere calculating-machine, is shown, for example, in his way of solving the following problem: "In a public square there is a fountain containing an unknown quantity of water; around it stand a group of people with vessels capable of containing a certain unknown quantity. They draw at the following rate: the first takes 100 quarts, and $\frac{1}{13}$th of the remainder; the second 200 quarts, and $\frac{1}{13}$th of the remainder; the third 300 quarts and $\frac{1}{13}$th, and so on until the fountain is emptied. How many quarts were there? In a few seconds he gave the answer, and

this is the simple process by which he obtained it: Take the denominator of the fraction, subtract 1; this gives the number of persons, multiply that by the number of quarts taken by the first person—that is by 100—and you get the equal quantities taken by each; square this number and multiply by the number of quarts, and you get the quantity in the fountain."—(*Every Saturday*, 1871, vol. ii., p. 118.)

In spite, however, of Mondeux's marvellous power of inventing and supplying arithmetical methods, he did not answer the expectations of his friends, but sank into obscurity and died almost unknown.

(13) George Bidder, 1876–1878, was the son of an English stonemason (see *Proceedings of the Institution of Civil Engineers*, vol. xv., London, 1856). His first and only instruction in numbers was received at about 6 years of age from his elder brother, from whom he learned to count up to 10 and then to 100. Most of the child's time was spent with an old blacksmith. On one occasion somebody, by chance, mentioned a sum and the boy astonished the bystanders by giving the answer correctly. While remaining at the forge he received no instruction in arithmetic beyond desultory scraps of information derived from persons who came to test his powers, and who often in doing so gave him new ideas and encouraged the further development of his peculiar faculty, until he obtained a mastery of figures that appeared almost incredible. Before long he was taken about the country by his father for the purpose of exhibition. This was so profitable for the father that the boy's education was entirely neglected. Even at the age of 10 he was just learning to write; figures he could not make. Some of the questions he had answered were the following (see *Philosophical Maga-*

zine, vol. xlvii., p. 315, London, 1816): "Suppose a cistern capable of containing 170 gallons to receive from one cock 54 gallons and at the same time to lose by leakage 30 gallons in one minute; in what time will the said cistern be full?" "How many drops are there in a pipe of wine, supposing each cubic inch to contain 4685 drops, each gallon 231 inches, and 126 gallons in a pipe?" "In the cube of 36, how many times 15,228?" Among others the famous Herschel came in 1817 to see the calculating boy.

Shortly afterwards he was sent to school for a while. Later he was privately instructed, and then attended the University of Edinburgh, obtaining the mathematical prize in 1822. Later he entered the Ordnance Survey, and then was employed by the Institution of Civil Engineers. He was engaged in several engineering works of importance; he is also to be regarded as the founder of the London telegraphic system. His greatest work was the construction of the Victoria Docks. Bidder was engaged in most of the great railway contests in Parliament, and was accounted "the best witness that ever entered a committee room." He was a prominent member, vice-president, then president of the Institution of Civil Engineers. In his later years there was no appreciable diminution in Bidder's powers of reckoning statistics in his memory, and of rapidly dealing with figures. Two days before his death the query was suggested that taking the velocity of light at 190,000 miles per second, and the wave-length of the red rays at 36,918 to an inch, how many of its waves must strike the eye in one second? His friend, producing a pencil, was about to calculate the result, when Mr. Bidder said: "You need not work it; the number of vibrations will be *444,433,651,200,000*."—(*Proceedings*

of the Institution of Civil Engineers, vol. lvii., London, 1879.)

The fact that Bidder became a highly educated man, and one of the leading engineers of his time; that his powers increased rather than diminished with age; and, above all, that he has given a clear and trustworthy account of how he obtained and exercised his talent, renders his testimony of the highest worth.

The Bidder family seem to have been distinguished for mental traits resembling George Bidder's in some part or another. Bidder was noted for his great arithmetical ability and his great memory. One of his brothers was an excellent mathematician, and an actuary of the Royal Exchange Life Assurance Office.

Rev. Thomas Threlkeld, an elder brother, was a Unitarian minister. He was not remarkable as an arithmetician, but he possessed the Bidder memory, and showed the Bidder inclination for figures, but lacked the power of rapid calculation. He could quote almost any text in the Bible, and give chapter and verse. He had long collected all the dates he could, not only of historical persons, but of everybody; to know when a person was born or married was a source of gratification to him. — (See *Spectator*, 1878 and 1879, vols. li. and lii.)

Most interesting of all is the partial transmission of his peculiar faculties to his son George Bidder, Q.C., and through him to two grandchildren. The son distinguished himself at Cambridge in mathematics, being seventh wrangler of his year. He became a thriving barrister and Queen's Counsel. He possessed a remarkable visual memory. He always saw mental pictures of figures and geometrical diagrams.

Bidder himself said: "I myself can perform pretty

extensive arithmetical operations mentally, but I cannot pretend to approach, even distantly, to the rapidity and accuracy with which my father worked. I have occasionally multiplied 15 figures by 15 figures in my head, but it takes me a long time, and I am liable to occasional errors."

(14) Truman Henry Safford, who was born within forty miles of Colburn's birthplace at Royalton, U. S., in 1836, was another arithmetical prodigy. He published an almanac when just nine and a half years old, and originated a new rule for getting moon-risings and settings, accompanied by a table, which saves fully one-fourth of the work in forecasting moon-risings. He furthermore constructed fresh rules for calculating eclipses. He multiplied 15 figures by 15 figures in not more than one minute. At the age of fourteen he calculated the elliptic elements of the first comet of 1849. After graduating from Harvard in 1854, he spent several years there in the observatory, made numerous additions to astronomical science, and became Professor of Astronomy in Williams College.

Gall (*Functions of the Brain*) observed several calculating boys of his time, as is only natural, for he located the memory for figures at a point corresponding to the root of the inferior frontal convolution.

Thus he exhibited a boy from St. Poelten, near Vienna, son of a blacksmith, who had received no teaching, but was quicker in calculating rows of figures by head than others were on paper.

A barrister consulted Gall about his son, aged 5, who busied himself extensively with numbers and calculations, so that it was impossible to fix his attention on anything else.

Gall knew a boy of 7, named Devaux, whose greatest

pleasure it was to go to all the fairs and check off the traders' calculations when they were making up their accounts.

He has given other examples, including cases of calculating idiots.

There are two things necessary for an ability to reckon rapidly,—a powerful memory for figures, and a real ability for calculating. The carrying out of long calculations in the mind depends, above all, on the accuracy of the memory for a sufficient length of time. The power to rapidly commit a group of objects or a line of a dozen figures to memory and to call it up again instantly, depends on the ease and rapidity with which one can impress it on the mind, on the accuracy with which it is reckoned, and the ease and rapidity with which it can be reproduced. The ease and rapidity with which a number of objects can be impressed on the memory seem limited in ordinary persons to about five at a glance.

The peculiar fascination for performing arithmetical calculations is sometimes a source of pleasure in itself.

In regard to a special inclination for mathematics and its relation to ability for calculation, and to other abilities likewise, great diversity is exhibited by the examples adduced. These can be variously grouped:

(1) Those having pronounced arithmetical bent combined with great powers of mental calculation, though not necessarily rapid; under this heading should be included nearly all arithmetical prodigies.

Corresponding to this class we might point out more than one distinguished arithmetician who possessed not the ability to calculate; indeed, it would not be going too far to say that nine out of ten mathematicians have at least but little liking for reckoning.

(2) Those with inclination and ability for mathematics, including arithmetic,—Nikomachos, Gauss, Ampère, Safford, Bidder.

(3) Those with special inclination and ability for arithmetic solely:

(*a*) Such as have had no opportunities afforded for cultivating other branches of mathematics,—Fuller, Buxton, Mangiamele.

(*b*) In spite of opportunities afforded,—Colburn, Dahse, Mondeux.

(*c*) Where the talent disappears ere an opportunity for development is rendered possible,—Whately.

There are children whose apathy nothing would seem capable of arousing, and others again who take keen interest in everything, and amuse themselves with even mathematical calculations without any end in view. Still others there are more rarely than either of the aforesaid groups, who limit their interest to mathematical calculations merely. Strange as the fascination for arithmetic seems, it becomes still more so when it is manifested at an age at which it is normally absent; strangest of all is the union of ability with the inclination.

Special precocity in calculation manifested itself at the following ages:

Gauss and Whately at 3.

Ampère between 3 and 5.

Safford and Colburn at 6.

Prolongeau at $6\frac{1}{2}$.

Bidder, Mondeux, and Mangiamele at 10.

One peculiarity in the imaginative powers of arithmetical prodigies is worthy of notice, namely their visual images. Bidder said: "If I perform a sum mentally it always proceeds in a visible form in my

mind; indeed, I can conceive of no other way possible of doing mental arithmetic." This was a special case of his vivid imagination. He had the faculty of carrying about with him a vivid mental picture of the numbers, figures, and diagrams with which he was occupied, so that he saw, as it were, on a slate the elements of the problem he was working out. He had the capacity for seeing, as if photographed on his retina, the exact figures, whether arithmetical or geometrical, with which he was at the time occupied.

Colburn said that when making his calculations he saw them clearly before him.

Chess-players who do not see the board must have a clear visual memory.

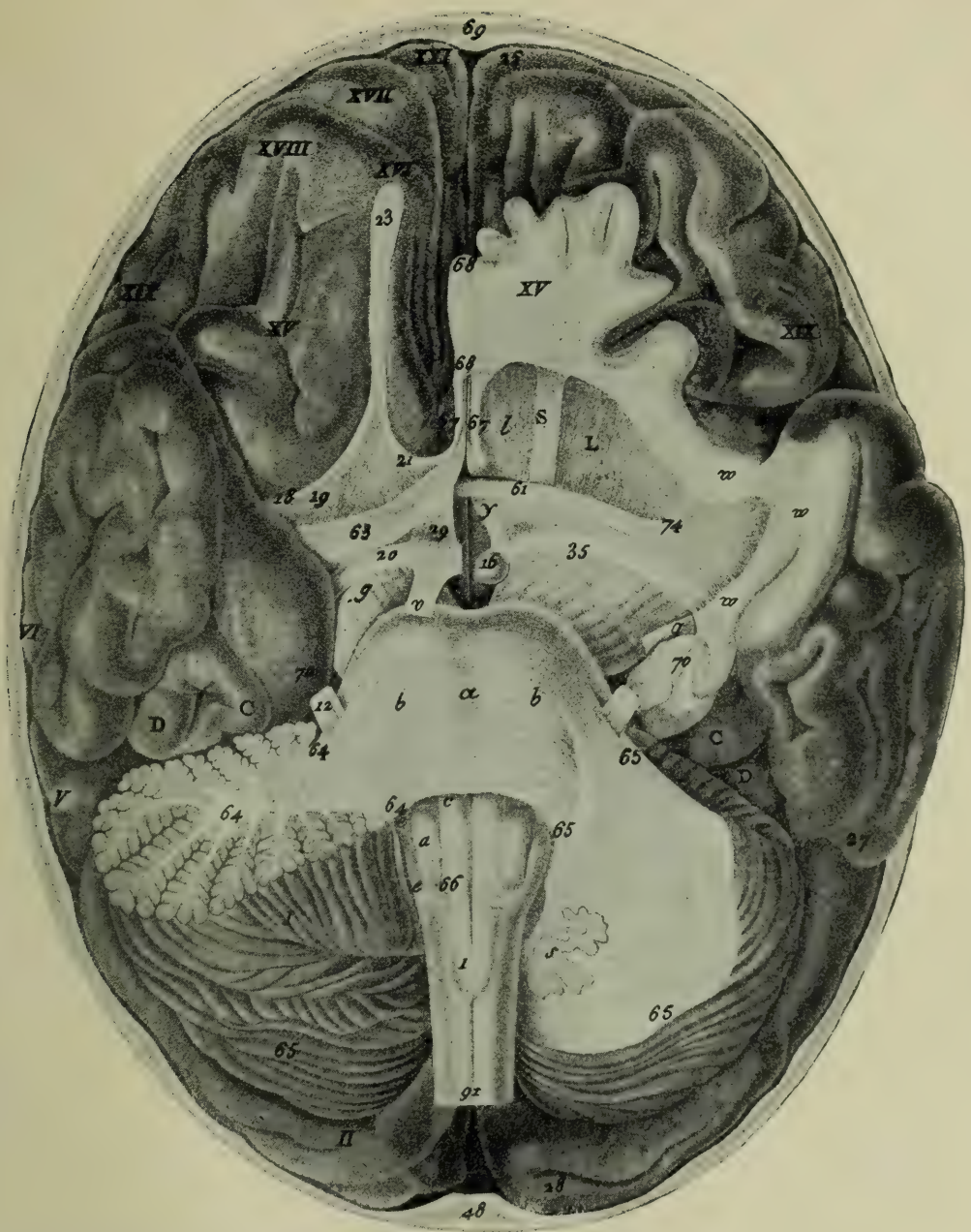
Binet (*Psychologie des grandes calculateurs*, Paris, 1894) has made an interesting psychological study of Inaudi and Diamandi, the two men who startled the scientific world by their great feats in mental arithmetic. Binet points out that whilst their memory for figures had acquired an abnormal extension, which excited astonishment and admiration, the other forms of memory, *e. g.* that for words, presented nothing special, and, in fact, in some respects they stood below normal.

In the case of Diamandi, his extraordinary memory for figures was a purely visual memory. When he learned a series of figures by looking at them he could repeat them in any order, and yet his visual memory for words was by no means above normal.

Experience clearly proves then the complete independence of the visual memories of letters and of figures.

4. Other Special Memories

It is usual to employ the word "memory" in a general sense to express the property, common to all



From Gall's Atlas, 1809 (*reduced*).

HORIZONTAL SECTION OF BRAIN.

XVI **Sense of form.** XVII **Memory of places.** XVIII **Colour-sense.**
XIX **Memory for numbers.** XXI **Memory for objects.**

thinking beings, of preserving and reproducing the impressions they have received; but psychological analysis and a large number of facts in mental pathology have demonstrated that memory should not be regarded as a single faculty, having a distinct seat. On final analysis memory proves to be a group of operations. There exist partial, special, or local memories, each of which has its special domain, and which are so independent that one of them may get enfeebled or disappear, or may develop to excess without the others necessarily presenting any corresponding change. The older psychologists missed this truth. Gall was the first to assign to each faculty its proper memory, and founded the theory of partial memories. It is at the present day supported by manifold facts.

Prof. L. Bianchi of Milan found that after destruction of the cortex of the prefrontal lobes in dogs and monkeys not only was memory, attention, and the judgment impaired, but the animals did not recognise either the places or persons with whom they had been previously familiar. He considers the centres *in the prefrontal lobes the association centres of the different memory centres*, so that the destruction of the former impairs the mental condition much more than the destruction of the latter.

There exist not only memories for words, music, figures, time, space, form, colour, objects, and places, but there are visual memories for each of these, and there are auditory memories for some of them.

Each one of these may become lost, while the others remain intact and unaffected in the slightest degree. Hence we are led to infer that they must possess an anatomical independence. Physiologists have as yet only localised the memory of words and letters, but

from the frequency with which these groups of memories get simultaneously lost, one may infer that the regions affected, albeit not identical, probably lie very close together.

The following cases serve to indicate the probable seat of some of the special memories, as they confirm Gall's localisations.

Horace M. Abel and W. S. Colman.—A case of puncture of frontal part of the brain by the spout of an oil-can, in which there occurred *loss of memory of previous events, of forms, objects, and places*, the lesion corresponding to the localisation of phrenologists. (See illustration, p. 263.)

The patient, G. T., a sober, well-conducted railway fireman, aged 36, was brought to the Peterborough Infirmary at 4 A.M. on 28th October, 1893, with the broken end of an oil-feeder protruding from his right cheek, a little behind the angle of the mouth. It was stated that in stepping from the tender on to the foot-plate of his engine, with the oil-feeder in his hand, he slipped and fell forwards, the spout of the oil-can being driven forcibly into his face. He was then quite senseless, but partially recovered consciousness in a few minutes. When he was being placed on the stretcher someone suggested a coat for his head, and he was sensible enough at that time to say that his own coat was on the engine, so that the loss of memory, afterwards so conspicuous, was not then present.

He reached the hospital less than an hour after the occurrence of the accident, and was seen at once by one of us. He was then quite conscious, and tried to answer questions. There was no hæmorrhage from mouth, nose, or ears. The metal spout of the oil-can was firmly fixed in the base of the skull, and required

firm traction with forceps to relieve it from the grasp of the bone, and then, owing to its tapering shape, it was easily removed by the fingers. It passed upwards and towards the middle line, and the concavity of the spout was directed from the middle line. The end of the oil-can was firmly plugged by bone from the base of the skull, so that it was converted into a blunt instrument in its passage through the brain. No hæmorrhage followed its removal. The wound was cleansed and a simple iodoform dressing applied. The track was entirely outside the cavity of the mouth.

There was now marked paralysis of the left side of the face, with inability to close the left eye completely, complete paralysis of the left arm, while the leg was comparatively little affected.

Mental Condition.—During the first fortnight he was drowsy, and slept heavily, but could be roused to answer questions. His answers were often ludicrously incorrect, but he evidently understood the questions. He *could not recognise his wife* or his old comrades, and he had also difficulty in recognising common objects and their uses. Thus on one occasion he drank his own urine from a vessel under the impression that it was water, and several times he got pieces of ice out of his ice-cup, and declared they were sweetmeats. This failure to recognise, that is, to recall previous mental images for the purpose of comparison with present ones, was strikingly shown by his failure for weeks to recognise a fellow workman who met with an accident, and was brought into hospital and placed in the bed next to him. But what was most remarkable was that *the whole of his life for twenty years before the accident was wiped out* from his memory. He asserted that he had never worked on the railway, and that he was a farm

labourer. He had, however, been on the railway for nearly twenty years, and previous to that had worked on a farm. All memory of the accident was gone, and has never returned. After he left the hospital some previous events did return, but, as will be seen later, after the lapse of a year there were still five years of which he could not remember anything.

He was able to leave his bed at the end of eight weeks, and at the end of three months was able to return home with very fair return of power in the leg, but little in the arm. He was kept under observation from time to time.

Nearly a year after the accident one of us again carefully examined him, and found his condition to be as follows: There was hemiplegia on the left side affecting the arm chiefly, but there was also distinct loss of power in the face and leg. He could walk several miles, but required frequent rests. There was no anæsthesia. The slightest touches were felt, and localisation was perfect. Sensation of pain, heat, and cold was quite normal on this side, and his muscular sense was accurate.

On the right side there was no motor paralysis, but there was definite loss of sensation to all forms of stimuli on the right upper eyelid, forehead, and anterior part of the scalp, corresponding with the distribution of the supraorbital and nasal nerves. There was also complete anæsthesia of the cornea. Taste and smell were unaffected. Vision was normal. On ophthalmoscopic examination the fundi were found to be quite natural. In all other physical respects the patient was quite healthy. His mental condition was extremely interesting. On the whole he was somewhat indolent and apathetic, and *there was very little control over his emotions.*

He laughed or cried at the slightest provocation, and was likely to do one or other at any remark made, and the emotional disturbance did not seem to be the expression of any mental pain or pleasure. His irritability of temper was said to have increased, and he was often hasty in his language, although not violent.

Condition of Memory.—There still remained a gap in his memory, although a smaller one than that which existed when he was in hospital; then, it will be remembered, there *was entire oblivion of all events for twenty years* prior to the brain injury. At this later period, however, he was able to recall the more striking events of his life up to five years before the accident,—after which all remained perfectly blank until about two months afterwards,—when he was able to recollect some incidents of his life in hospital, and he could recall his life in general from then to the time of examination, although he could not trust his memory on small matters. We were unable to trace the development of this partial return of memory, but it seems to have been in part due to the habit of his "mates" of coming in and talking to him of the past, and continually reminding him of occurrences which were likely to have made an impression on him. There was still extreme difficulty in retaining in his memory any passing events. If he went out for a walk by himself *he was unable to find his way back*, and often *failed to recognise his own house* when he was outside, and there was also frequent *failure to recognise common objects* and their uses, although nothing now occurred so marked as his not recognising the nature of urine and of pieces of ice referred to in an earlier note. There is thus present in a modified degree the condition described by Hughlings

Jackson as "imperception." There was no aphasia at any time, and no difficulty in expressing himself; it seems to be the ideas that were wanting, and not the words in which to express them. His reasoning processes were fairly orderly, but as, owing to the blanks in his memory, he often argued from false premises, he arrived at ludicrously incorrect conclusions. For example, he occupied one of the houses built by the railway company for their servants, and as he had no recollection of having worked for them for five or six years, he argued that he had no right to be there, and insisted with unnecessary warmth that his wife should pack up and leave the house before they got into trouble for being there. This mental condition went on increasing latterly. At first there was merely failure to remember and recognise; now he assumed action rather impulsively on the strength of such false or imperfect memories.—(*British Medical Journal*, 16th February, 1895, p. 356.)

M. Jastrowitz.—*Loss of the sense of time, memory of places, and of objects.*—Patient, wife of a major in the army, 42 years of age, had a syphilitic scar of 3 cm. in length over the glabella, that is, above the root of the nose. Though intellectually quite normal, **she could not distinguish either time or locality and mistook objects.**

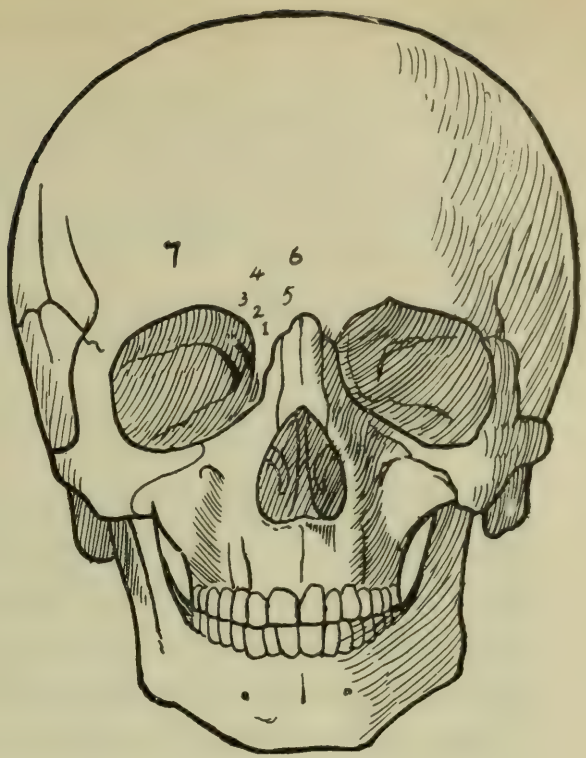
The post-mortem examination revealed intermeningeal **hæmorrhage at the anterior root of the superior and middle frontal convolutions.**—(*Deutsche medizinische Wochenschrift*, 15th April, 1887.)

Thos. Laycock.—*Loss of the sense of weight, sense of resistance, the lesion corresponding to the localisation of phrenologists.*—A case of fracture of the base of the skull **just behind the orbits,** there being a fissure about a quarter of an inch in width. The patient, a man aged 29, was treated surgically. Much lacerated and contused brain substance was removed. On recovery **patient had lost the conception of the quality and position of foreign bodies, their weight, and resistance,** through the sense of touch.—(*Austral. Med. Journal*, 15th July, 1893.)

Robert Sommer.—*Loss of memory of form and shape*—described the case of a man named Voit, who, after fracture of the skull, forgot the shape of objects, and, though he could draw well an object before him, made a shapeless blur when the object was withdrawn.—(*Zeitschrift für Physiologie der Sinnesorgane*, vol. ii., part 3.)

THE PERCEPTION OF
AND
SPECIAL MEMORIES
FOR

1. Form or Shape.
2. Size or Distance.
3. Weight or Resistance.
4. Places.
5. Objects.
6. Facts and Events.
7. Time.



Exact outline of feeder spout after removal. The dotted line represents the position of the cheek wound; from A to B measures 6⅛ inches.

Fig. 1.—Diagram (from a photograph taken a year after the accident,) indicating the probable course of the tin spout.

(Reproduced from the *British Medical Journal.*)

E. v. Bergmann—*Loss of memory for objects, for locality and for names*—observed a case of severe injury to the head, followed by loss of consciousness lasting four weeks. Patient had lost memory for objects, localities, and names. He regained the two former, but the loss of the latter was permanent.—(*Allg. Zeitschrift für Psychiatrie*, 1869, vol. vi., p. 547.)

Willbrand observed the loss of appreciation of time.

Förster observed the loss of the memory of places.—(*Archiv für Ophthalmologie*, vol. xxxvi., p. 101.)

Groeunow did the same.—(*Archiv für Psychiatrie*, vol. xxiii., p. 360.)

An idiot-savant's memory is often very acute for special forms, such as remembering dates and past events. Several children under Dr. Langdon Down's care have possessed this faculty to an extraordinary degree. One idiot boy never failed to be able to tell the name and address of every confectioner's shop that he had visited in London—and they had been numerous—and could as readily tell the date of each visit. Another could tell the time of arrival of all the children at the Institution, and could supply accurate records in relation to it when needed.

One boy, under Dr. Down's care, had a very unusual faculty, namely, the perfect appreciation of past or passing time. He was seventeen years of age, and although not understanding, so far as he could gather, the use of a clock face, could tell the time to a minute at any part of the day, and under any circumstances. Dr. Down tried him on numberless occasions and he always answered with an amount of precision truly remarkable.

Dr. E. T. Boland brought before the New England Psychological Society, 11th October, 1887, an idiot savant, a boy named George, 16 years old, whose strong point was that he could answer questions as to calendar dates in his past life and for a year or two in the future. He had never learned to read, sight being too

defective, even had his capacity permitted. He was an imbecile in every respect.

5. The Colour Sense

Dr. Dalton, the most famous example of colour-blindness, had a deficient development of one of the supra-orbital convolutions in the region where Gall placed the sense of colour. Mr. Ransome, the medical attendant of Dr. Dalton, declared that the eyes, on dissection, showed no unusual appearance. No account of the brain was given publicly, but the following is an extract relating to it, from a letter of Mr. Ransome's on 20th March, 1845, to his friend, Mr. Phillip Holland, a Manchester surgeon.

"I have very little to add to the account of Dr. Dalton's eyes, which I sent to Mr. Stanley. (This surgeon read a paper on the subject to the Royal Medical and Chirurgical Society, 1st March, 1845). There was no disease or change of structure in the anterior lobes of the brain, but a deficiency in size and development of one of the small convolutions resting on the orbital plate. Mr. Bally took a cast, of which I have no doubt you could procure a copy." Mr. George Combe writes on the subject that "Mr. W. Bally of Manchester had made a cast of the orbital plates, on inspecting which we had ascertained the correctness of the statement in the newspapers, that it presented a high ridge indenting the brain at the situation of each organ of colour." This smallness of the organs was also remarkable in the bust of Dr. Dalton modelled by Cardwell, and Mr. Bally has stated that "its real size is still less than it appears in consequence of the thickness of the bone behind the frontal ridge." In another letter, written shortly

before the above, to Mr. Stanley, Mr. Ransome says: "I ought in fairness to state (though no phrenologist), that there was marked deficiency in the convolutions of the brain over the orbital plates which are assigned to the organ of colour. *Valeat quantum* and give the fact."

The *Manchester Courier*, of 17th August, 1844, contained the following announcement:—

"Mr. Bally of King Street has just completed an exquisite little bust of the lamented philosopher reduced from a cast taken after death. In height it is about eight inches, and, being a facsimile of the one taken after death, is one of the best likenesses we have yet seen. Mr. Bally has also taken a cast of the philosopher's brain, which possesses a very remarkable feature in its organisation. It is well known that Dalton was unable to distinguish colours, and we find that on both sides of the frontal sinus the phrenological organ answering to the faculty is singularly defective, there being a high ridge, and corresponding indent in the brain, precisely where the organ is placed by phrenologists."

Dr. Wilson wrote: "Here then, according to the judgment of those present, there appeared a marked deficiency of that portion of the brain which phrenologists regard as the organ of colour, in the person of the most famous example of colour-blindness; and though he were not famous, his case would deserve record, as the solitary one where the brain itself was examined."—(*Journal of Psych. Medicine*, 1856, p. 106.)

Sense of Space and Colour-Sense

Dr. Samuelsohn had a case under his charge, where, after an apoplectic seizure, the sense of space and light was intact, but where the colour-sense was utterly extinguished.—(*Centralblatt für die med. Wissenschaften*, 1882, p. 851.)

Steffen had a similar case, and concludes from it "that in the main central organ, the brain, the centres for the sense of 'space,' and for the sense of 'colour' are divided, no matter how near to each other they may be estimated, but there is a special centre for each of these senses." —(*Graefe's Archiv*, vol. xxvii., p. 6.)

Similar observations by **Bjernum, Brill, Cohen, Förster, Schnelle,** etc.

Even should the localisation of the colour-sense by Gall be proved by future investigators to be wrong, *he certainly was the first to attribute colour-blindness to a defect of the brain.* Look over the hazy speculation on colour-blindness up to very recent years, in which this imperfection has been attributed to some defect in the eye, in utter ignorance of the fact that, more than a century before, Gall had clearly shown the defect to be cerebral, and had indicated its probable seat.

Lord Jeffrey, in noticing Combe's account of Gall's discovery, said:—

"So far is it from being true that we do not perceive colour by the eye, that in reality it is colour, and *colour alone*, that is the primary object of its perceptions. What we see, indeed, is only light; but light is always coloured (if we include white as a colour), and the different colours are in reality but so many kinds of light. To say that we do not see colour by the eye is in reality to say that *we do not see at all*, for the strict and ultimate fact is that we never see anything else."—(*Edinburgh Review*, October, 1826.)

The localisation of the colour-sense by Gall may be wrong, but he does deserve credit for having been the first who searched for it in the brain. The folly of the blind opposition to everything that emanated from Gall, or from phrenologists, is made evident here, for it took nearly a century to rediscover the simple fact that the appreciation of colours has its seat in the brain and not in the eye. When will such silly

opposition cease? Gall made his statements in good faith; why not examine them aright and in equally good faith?

What Gall knew at the close of the eighteenth century is only just dawning upon the scientists of the present day. Thus in a paper on "Colour-blindness," contributed to vol. v., part 2, of the *Proceedings of the Bristol Naturalists' Society*, in 1887, Professor W. Ramsay suggests that the particular defect which causes colour-blindness may lie in the brain, not in the eye. Certain persons, as he points out, are incapable of judging which of two musical tones is the higher, even when they are more than an octave apart. Yet such persons hear either tone perfectly; the defect is not one of deafness. "It must be concluded," says Professor Ramsay, "that in such a case the brain is the defaulter. And it may equally well be the case that the inability to perceive certain colours is not due to a defect in the instrument of sight—the eye, but to the power of interpreting the impressions conveyed to the brain by the optic nerve. If this be the case, the problem is no longer a physical one, it falls among those with which the mental physiologist has to deal."

6. Conclusions

It has been demonstrated in this chapter:

1. That to Gall belongs the honour of the discovery of the speech-centre in the third frontal convolution.

2. That the sense of the relation of tones was located by Gall in the brain bordering on, if not identical with, the region, which numerous modern observers have found to be involved when the musical ability is lost through injury or disease.

3. That the memory for numbers and arithmetical

ability have a special seat in the brain at the point where the third frontal convolution becomes the external orbital; an observation of Gall which is confirmed by Möbius and Flechsig at the present day.

4. That other special memories have special centres in the brain, most probably in the supra-orbital and prefrontal convolutions.

CHAPTER VI

MATERIALS FOR FUTURE LOCALISATION

1. The Centre for the Revivification of Ideas.
   Imagination.—Herbert Spencer's evidence and localisation.
2. The Centre of Exaltation.
   Five cases of localised lesion.
3. The Centre of Imitation and Mimicry (Gall).
   The centre for the movements of the facial muscles of modern experimenters.
4. The Centre of Sympathy.
   Herbert Spencer's evidence and localisation.
5. The Sentiment of "Veneration."
   Six cases of religious insanity with localised brain lesion.
6. "Firmness" and the Leg-Centre.
   Five cases of localised lesion.
7. The Functions of the Occipital Lobe.
   Experimental and other evidence.—Ten cases of localised lesion

CHAPTER VI

MATERIALS FOR FUTURE LOCALISATION

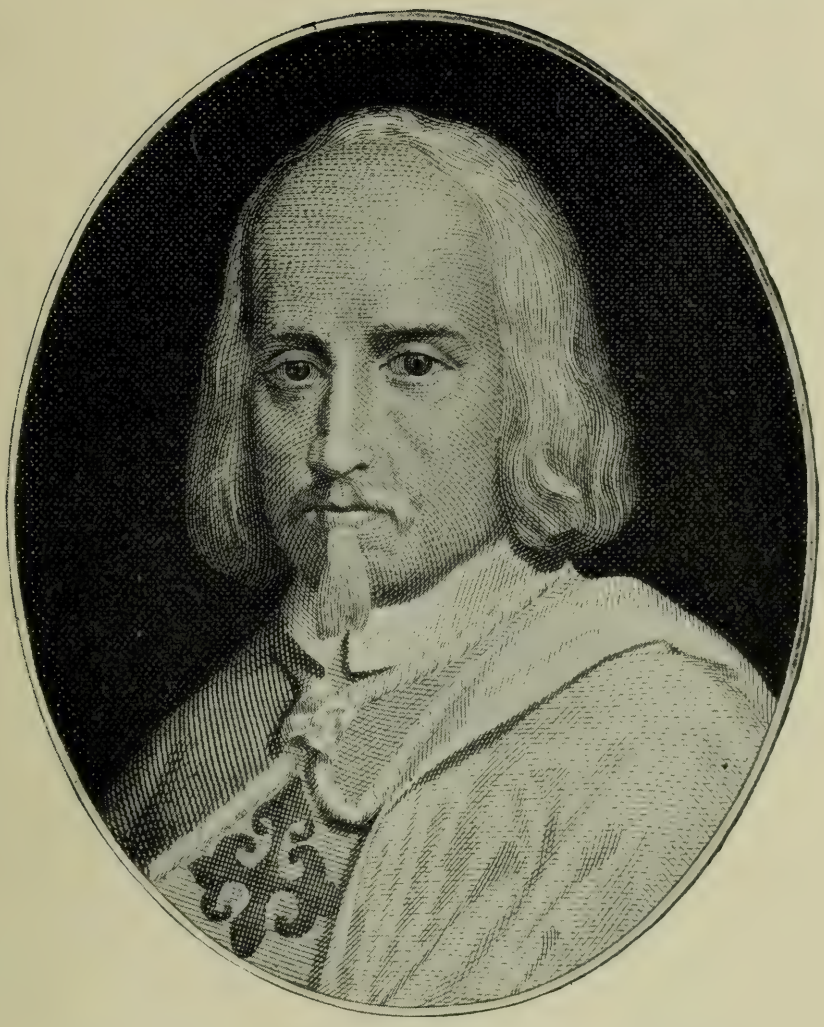
1. Centre for the Revivification of Ideas

MR. HERBERT SPENCER has written some able articles on Phrenology (*Zoïst*, vols. i. and ii.), in which he not only demonstrated his belief in Gall's system, but showed himself an acute observer. One of these articles, entitled "A Theory Concerning the Organ of Wonder," is of special interest.

Dr. Gall observed a connection between visions or hallucinations and a particular brain-area in the antero-superior part of the frontal lobe, but he was not able to arrive at any definite conclusion as to the function of this part, and he left it unnamed. His followers, however, as the result of their observations on living heads, maintained that a large development of this area "unnamed" by Gall is accompanied by an active sentiment of spirituality, wonder, and marvellousness. Against such arbitrary and unscientific proceeding Mr. Spencer objected in one of his contributions to the *Zoïst*, entitled "A Theory Concerning the Organ of Wonder," in which, instead of the name of "wonder," he assigned that of "reviviscence," and supposed this faculty to be the chief agent of imagination. In this essay, as in the others, Mr. Herbert Spencer shows himself to be an

acute observer of the differences in the shape of heads. His own words are :

"The reader will at once see that the liability to be deceived by spectral appearances must, other things being the same, vary as the power of the proposed faculty. The more efficient the instrument for the revivification of impressions, the more nearly will the images produced approach in appearance the realities. Celebrated painters have possessed the power of calling up objects so distinctly before the mind's eye as to render the process of depicting them little more than copying from Nature. If, then, the faculty be capable of effecting so much under the influence of its ordinary stimulus, we may reasonably assume that its unnatural actions will be accompanied by a difficulty in distinguishing revived impressions from real perceptions. Numerous cases of mental illusions from a slightly disordered state of the brain might be quoted. Similarly may be explained the mental action that gives rise to the seeing of ghosts and apparitions. During the gloom of night, and under the influence of appropriate feeling, every dimly distinguished object calls up in the mind some pre-existing impression to which it may chance to bear a faint resemblance, and amid the excitement resulting from extreme fear, the mental image is rendered so vivid as to be mistaken for the thing seen. Persons will, of course, be subject to such illusions in the ratio of their endowment of the faculty of reviviscence. . . . Reviviscence creates mental imagery, love of ghost stories, witchcraft, affording scope for imagination. It has been maintained that reviviscence is the parent of imagination—that imagination is but a revival and putting together of impressions previously received by the per-



DON PEDRO CALDERON DE LA BARCA (1600–1681).

Writer of dramas of a **mystical** character.

Notice the **height** of the head and its **breadth** in the *upper* region.
Compare this head with that of *Boccaccio*, Plate XVI., p. 322.
See also Montaigne's Portrait, Plate III., p. 18.

ceptive faculties, and that upon the efficiency of the reviving agent must mainly depend the vividness of ideal images. Poets, therefore, who are in a great measure distinguished by their powers of imagination, may be naturally expected to possess a large endowment of reviviscence. That such is the fact may be seen by reference to the heads of Milton, Shakespeare, Spenser, Dryden, Beaumont, and Fletcher (dramatists), Drummond, G. Buchanan, Otway, Malherbe, Tasso, Young, Bunyan (Bunyan was a true poet, philosophically speaking, though not conventionally recognised as such), Cowper, Darwin, Scott, Byron, Wordsworth, and Hogg. In all of them the organ is large, in some very large. The names of other poets might doubtless have been added to the list had likenesses of them been attainable. . . . Further evidence is deducible from the fact that so many men of powerful memory or brilliant imagination have been subject to mental illusions. Tasso held conversation with a spirit gliding on a sunbeam. Malebranche heard the voice of God distinctly within him. Pascal often started from his chair at the appearance of a fiery gulf opening by his side. Luther conversed with demons. Descartes was followed by an invisible person calling upon him to pursue the search of truth. Swedenborg described heaven and hell. Benvenuto Cellini was accustomed to behold a resplendent light hovering over his own shadow. Dante talked with spirits, and Cowper was haunted with spiritual sounds. Inasmuch as these cases favour the conclusion that the power of reviving impressions, either as manifested in memory or imagination, frequently co-exists with the liability to spectral illusions, they give collateral support to the proposed theory, for they show that these

several traits emanate from the same peculiarity of organisation."

Mr. Herbert Spencer's theory, then, amounts to this, given in his own words:—

"That the faculty entitled 'wonder' by the phrenologists has for its ultimate function the revival of all intellectual impressions, that it is the chief agent of imagination, and that it affords a tangible explanation of mental illusions, either when due to disordered states of the brain or to unusual excitement."

Curious to observe, modern scientific researches seem to confirm Mr. Spencer's assertions. For the situation of "wonder" or "reviviscence" corresponds with one of Dr. Ferrier's brain-areas, "the excitation of which causes the eyes to open widely, the pupils to dilate with movements of the eyeballs and head. It gives the appearance of attention, and the movements indicated are essential to the revivification of ideas. Dr. Ferrier's explanation is:—

"Just as the initiation or partial excitation of any particular movement reacts back upon the sensory cohesions with which it is associated, so the movements of the head and eyes react back on the centres of vision, and keep the ideal object in the field of clear consciousness, and through this recall its various sensory and motor associations. It is not essential that the object revived in idea should be so clearly revived in the visual field as the actual object itself. There are great differences in this respect among different individuals."

Thus Dr. Ferrier acknowledges that his centre for the volitional control of head and eyes is the physical means for the revivification of ideas, and confirms Mr. Herbert Spencer's observation and localisation of the faculty of "reviviscence" foreshadowed by Gall.

2. The Centre of Exaltation

The area, a portion of the ascending frontal convolution, in which FERRIER located the centre for movements of the muscles which elevate the cheeks and angles of the mouth as expressed in smiling and joyful emotions, is the same as GEORGE COMBE found prominent in persons predisposed to cheerfulness and sanguine states of mind. He termed the faculty "hope." It appears that in dementia paralytica, in which disease there are almost invariably optimism, insane joyousness, delusions as to wealth and grandeur, whilst one of the earliest physical symptoms is trembling at the corners of the eyes and mouth, this part of the brain, the most posterior part of the frontal lobe, is almost invariably involved.

Hope sometimes remains when reason yields but little ground for it. It affords that assurance of success which reason could only derive from experience.

Whether Combe was right or wrong, it is a fact that DR. VOISIN, the eminent French authority, assumes a similar "centre of exaltation" (*centre de grandeur*)in the same area.—(*Traité de la Paralysie Générale des Aliénés*, Paris, 1879.)

F. Lallemand.—Jean Pierre Bailly, aged 60, after some ill-treatment by soldiers, had several paralytic seizures which passed off. Coincidently his character changed. He developed an excessive "hopefulness," a blind belief in obtaining a considerable fortune, and planned grand enterprises. One characteristic deformity was observed—his mouth was drawn up on the right side.

Post-mortem.—A tumour was found, the size of a large egg, on the posterior surface of the right frontal lobe.—(*Recherches Anatomico-pathologiques sur l'Encéphale*, Paris, 1830.)

V. Magnan.—The patient, a butcher, 50 years old, showed, a few days before admission, excessive activity in making exalted plans, possessed by an abnormal cheerfulness and optimism. He died the day after admission.

Post-mortem.—There was a symmetrical lesion in the middle $\frac{3}{5}$ of each ascending

frontal convolution, the active congestion extending to half the middle and lower frontal convolutions.--(*Revue Mensuelle de Médicine et de Chirurgie*, 1878, p. 32.)

T. Claye Shaw.—*Surgical treatment of general paralysis of the insane.* —A man, aged 36, a packer at the Army and Navy Stores, had, when admitted, grandiose delusions, and was impaired in both gait and speech. He was trephined by Mr. Harrison Cripps. The operation was carried out on the right side of the head (just behind the centre of exaltation) about the middle of the post-central convolution, and consisted in making two one-inch trephine holes, about two inches apart, and removing the intermediate bone. There was considerable bulging of the tissues beneath the opening, indicating pressure. The underlying dura mater was removed, and the pia incised. A considerable quantity of fluid drained away, and the opening was then closed by replacement of the skin. Mental improvement followed, the intellect was clearer, patient became coherent, and had no delusions. He died suddenly in convulsions.

At the post-mortem examination it was found that the trephine hole was completely filled up by a tough fibrous membrane. On the under-surface this membrane was adherent to about the size of a shilling to the cortex in the middle of the ascending frontal convolution (exactly the centre of "Exaltation.)"

Case 2. Similar.—(*British Medical Journal*, 12th September, 1891.)

Barton and Gayton.—*Symptoms of exaltation; operation; recovery.* —A woman, aged 39, married, no family. There was a history of a blow on the head received whilst running up-stairs, when she knocked her head against the top of the doorway. This spot, which was the seat of very great pain and headache, was selected for the operation, namely, one inch to the right of the middle line, and one inch behind the coronal suture. **Patient had exalted ideas of wealth, delusion as to possessing carriages and horses,** etc. There were no convulsions previous to the operation, but there were two afterwards. A fortnight after she began to improve, and from that time made a steady recovery. The delusions and headache were both cured. Before the operation she wrote badly and incoherently; after the operation her handwriting had improved, and she wrote a reasonable letter. She was discharged.—*British Medical Journal*, 12th September, 1891.)

3. The Centre for Movements of Facial Muscles—Mimicry

Gall observed certain portions of the brain in the middle frontal convolution to be prominent in all facial mimics. This centre for the imitation of gestures nearly corresponds to the centre for movements of the facial muscles discovered by modern physiologists, and located at the posterior end of middle frontal convolution

and the adjacent area of ascending frontal. Gall's collections contained many casts of heads of eminent actors in support of his theory.

That this talent for imitation of gestures is not acquired, though no doubt it may be improved by education, is shown by the frequency with which it is observed in idiots and madmen. The centre for the movements of facial muscles, or centre of "Imitation," adjoins Gall's centre of "Sympathy," which is only another form of involuntary imitation, whereby we control the gestures, tones, phraseology, and general demeanour of those around us.

In "aphasia" the facial muscles are often involved, which fact is easily explained by the vicinity of the speech centre to the "facial" centre.

4. The Centre of Sympathy

Gall recognised an organ of goodness, benevolence, gentleness, compassion, sensibility, which he observed in the superior frontal convolution a little anterior to the fontanelle. Gall observed the development or deficiency of this region in normal men and in the insane.

Of all animals the dog is the one in which this sentiment is most marked; we are not surprised, therefore, to find that electrical excitation of this brain-area caused lateral or wagging motion of the tail (Ferrier, p. 250 (3)).

Gall, speaking of some pups, says: "Hardly were they fifteen days old, when one noticed by the movements of the tail the contentment and good will of one, not only toward other little dogs, but to all persons who approached him. The other, on the contrary, growled without ceasing, and bit whatever came in his way. From that time, I observed attentively

these two animals. As I was not unaware that men attribute such differences of character to education, I charged all those who habitually approached these dogs to lavish caresses on both of them equally. I took all imaginable pains to soften the character of my little wicked one, but nothing could change him; he even bit his mother, if she disturbed him ever so little. In their sixth month they were attacked with disease, and gently as both were treated, the wicked one did not cease to growl until his death, and to bite whoever approached him; the other, on the contrary, did not cease, to his last moment, to show marks of attachment and gratitude to all who took care of him. Even my servants were extremely struck with the contrast of manner in these two dogs."

Farther on Gall remarks: "Examine the region alluded to of the head or cranium of animals who are noted either for the savageness or gentleness of their character, and you will find it much more level in the tiger than in the lion; in the hyena and in the wolf much more level than in the dog; in the common cat more level than in the angora cat; in baboons absolutely flat and depressed below the level of the eyes. You will perceive it, on the contrary, prominent in the ourang-outang, and in all the species of monkeys of a gentle character. When I perceive in a monkey a forehead thus shaped I do not hesitate to approach him.

"A collection of heads of different examples of animals of the same species, collected with reference to the kindliness or viciousness of their character, or the close observation of living animals made with the like intent, has furnished undeniable evidence of the truth of what I advance. The adversaries of organ-

ology are as little disposed to form a collection as to institute observations; still, so long as they will not adopt such course, their objections will bear no weight. It is only facts, such as nature offers, which prove decisive.

"Inasmuch as a collection, such as I have indicated, may prove of utmost utility, even as regards economy, domestic alike and rural, I will give the reader some directions about it.

"In the horse, the organ of benevolence is placed in the middle of what is called the 'forehead,' three fingers' breadth above the eyes. When this region is sunken or retreating, we may be sure that the horse is vicious, unsafe, and disposed to bite and kick. Gentle, docile, good horses, on the contrary, have this region on a level with the eyes, or even prominent. I have made thousands of observations on this subject, and have never found an exception.

"Jockeys have another mark by which they distinguish the character of the horse. A gentle and docile horse stands firmly, however spirited he may be in other respects, with his fore feet perpendicular, and the eye directed in such a manner that one cannot see the white of the ball. A vicious horse, on the contrary, takes a position which indicates distrust: he plants his fore feet a little obliquely forward; when his build allows, he keeps his head raised and a little inclined backward; the direction of his eyes is constantly such that a part of the white keeps visible. These signs are just as they should be, but they are not the organic cause of the good or the bad character of the animal; they constitute only the outward reflex.

"If, besides the indications I have just described, there is superadded that the two ears are close to-

gether, the horses are at the same time skittish and vicious. It is of these that one should be particularly on guard; those that are gentle, but good, are less dangerous.

"The worthy Princess of Schwartzenberg, who met so tragical an end at Paris, one day showed me into her stables at Vienna, and begged me to point out to her, according to my organological discoveries, which of the thirty horses there was the gentlest. The one I pointed out proved to be the saddle-horse of the Princess herself; he had been reserved for this service on account of his extreme gentleness.

"At Berlin, at the stables of M. de Beyne, Minister of State, M. Spurzheim and myself pointed out, among forty cows, those that were most vicious.

"The Marquis de Boisgelin presented me with the head of a tame wolf, which, from its birth, had been remarkable for its gentleness. Even when, by sending him out with the hounds, he was set at bay, he licked his master's hand, as if to implore his pity. In the region above described, his head is much more prominent than that of wolves generally.

"I possess a considerable collection of crania of dogs. The conformation of each of these has confirmed the observations I had made on the living animal; but I would here observe that we must not confound ill-tempered dogs with vicious ones. There are dogs which are always bent on fighting, which growl continually, but never bite; there are among men similar characters — benevolent tormentors. What appears at first glance to be malice, proves merely a restive, odd, and testy humour, rather than malice, strictly speaking; traits by which Xenophon has characterised Xantippe. All my numerous heads of cats, whose dispositions I

have known in regard to gentleness or viciousness, confirm my observation. The heads of vicious cats are always much more depressed and flattened in the anterior superior region than those of cats of a mild, social character.

"At the king's garden we made in this respect observations on the tiger, the panther, the hyena, and on wild animals of various species, which prove perfectly to the point. Those animals which have the region alluded to most depressed are always the most wicked and intractable.

"The brown bear has the head much more elevated than the extremely ferocious and savage white bear. Among pigeons, the most vicious *Columba nicobatica*, crested pigeon, has the most flattened head.

"In the cock, the canary bird, and many other species, whose character I have long observed, this fact is likewise borne out. This character may generally be traced in all animals *in which the internal table of the frontal bone is parallel to the external*, as in the horse, the monkey, the dog, and several species of birds. It is far otherwise when the internal table of bone diverges from the external. It is hence necessary to know the structure of the cranial bones in the species on which one wishes to pass judgment. In the elephant, the hog, etc., we cannot infer from the contour of the cranium the form of the brain. In the bull and the cow, the internal table diverges indeed from the external, but they are parallel in the region where the organ of benevolence is situated; on that account, when a bull or a cow has this region depressed, we may conclude that they are mischievous, and that when this region is flat or even prominent they are gentle. The same thing takes place in cats.

"What I have said above explains why the characters of animals that have received the same training, and been placed under like circumstances, may withal totally differ. The reason of this difference is not such as we have seen it in external objects; it depends on a peculiar cerebral part, the greater or less development whereof does not itself depend on external circumstances, but on a law of original organisation still unknown to us."

I have already pointed out that HERBERT SPENCER was in his younger days an ardent phrenologist. Here are his original observations regarding Gall's centre of gentleness, sensitiveness, and benevolence. This area Herbert Spencer regards as the centre of "sensitiveness." He says:

"Let us now consider the evidences that may be derived from the inferior creation. Mark the crania of two opposite varieties of the canine species; for instance, a greyhound, and one of the smaller breed of spaniels. In the greyhound not only is the whole upper surface of the skull greatly depressed, but the medial portion more especially is marked by the deep furrow that traverses it from back to front, indicating that the central part of the anterior lobe is unusually small. In the spaniel, on the other hand, particularly if it be one of the lap-dog tribe, the entire forehead is found to be much higher and more fully developed; in addition to this, the hollow seen in the greyhound no longer exists, and the front part of the coronal region is protuberant and of uniform convexity. In the one case the supposed organ of sensitiveness is very small, in the other very large. When we compare the qualities of these two families of dogs we find that the distinctive traits of disposition that might

have been anticipated from a glance at their discrepant organisation are exactly coincident with their known characteristics. The greyhound is the dullest of his species; his moments of delight are few and far between; the greater part of his existence passes in a state of quiet carelessness; his grave visage and drooping tail are but the outward indices of his inward apathy, and his every action stamps him as the most phlegmatic of his race. Look at the contrast exhibited by his merry relation, the spaniel, more especially in the phases of highest cultivation; he is his very antipodes: seems actually made up of susceptibility, manifests on all occasions the utmost acuteness of feeling; is elevated to ecstasy by the most trifling act of kindness or the smallest mark of approbation; and shows, on the contrary, by his piteous look and mournful attitude how much he is distressed whenever he incurs his master's displeasure. His manners are eminently expressive of extreme happiness or misery as circumstances may determine, and everything implies the existence of a strong perception of pleasure and pain.

"Another remarkable fact of great significance, when examined in connection with the proposed theory, is suggested by observing the fighting capacities of the several varieties of dogs. All those kinds that are noted for the savageness and pertinacity of their attacks, such as the bulldog and his congeners, who have been known in some cases to retain their hold even when their limbs have been cut off, are not only remarkable for their large Combativeness and Destructiveness, but likewise for the same deficiency in the organ of Sensitiveness pointed out in the greyhound. Exposed as they are by their snarling propensities to frequent bites, wounds, and bodily injuries of all kinds, it was

necessary that they should be gifted with a lower degree of sensibility than other animals. Accordingly we find that all such dogs are thus phrenologically distinguished, and as we ascend the scale to those of a more placable character, we see that gradual change in the form of head which is theoretically indicated until we arrive at the peaceful spaniel, where the combative instinct is at its minimum and the power of feeling at its maximum; which circumstance is immediately suggestive of the idea that, as the liability to injury has decreased, the bodily susceptibility has increased. The same relation between the habits of the creature and its cranial conformation will be found to exist amongst other genera; the deficiency of Sensitiveness being proportional to the danger of physical suffering incurred by the mode of life."

5. The Sentiment of Veneration—Religious Insanity

Gall placed in the region of the anterior fontanelle in the superior frontal convolution the "sentiment of Veneration," having first observed a high head in that region in the case of his brother, who had a strong tendency to devotion, and whose hours of recreation even were spent in pious pursuits. Eventually when he grew up, he fled from home, became a hermit, and later on entered Holy Orders. Subsequently Gall made a special study of "Religious Insanity" in asylums. His atlas is illustrated with the portraits of thirty renowned men of all occupations, all of whom showed large "Veneration."

Braid and recently Pitres have excited the top of the head at the anterior fontanelle in hypnotised subjects, Pitres being totally unacquainted with phrenology. The result was "elevation of the eyes, the hands are put in position for prayer, there is an expression of

ecstasy, there are visions of saintly figures to whom the patient addresses his prayers." In no other region of the head could the same effect be produced.

The "Gage" case (American Crowbar case) is a typical case of injury to Gall's centre of the sentiment of veneration. The crowbar shot through the anterior fontanelle, and the man, Gage, became "irreverent, indulging at times in the grossest profanity, which was not previously his custom, and manifesting but little deference for his fellows."

A. P. Millar.—Case of a clergyman suffering from religious insanity. Patient had neglected his health previously. Sudden outbreak. He had called on a notorious drunkard to convert him to better ways, but was turned out of the house by him. This conduct had such an effect on his already excited feelings that he rushed into the public square, holding his Bible in the air, and knelt down praying to God to subdue the obduracy of the sinner's heart, and, rising up, began most vociferously to exhort people to repentance, for sin had darkened the land, and the judgments of God were coming upon the earth. After much difficulty he was compelled to go home, when he ran up into his bedroom, stripping and washing himself by dashing basins of cold water over his body, and praying most earnestly "that the waters of life he was now washing in would cleanse his soul from all sin." This process he had repeated thrice, and such was the intensity of his convictions respecting his own impurities that each time he determinedly refused to be dressed in the same clothes, because they were unclean. He died twelve days after the event.

Post-mortem.—Inflammation and hæmorrhage over both superior frontal convolutions in the median line, corresponding to the anterior fontanelle. — (*Provincial Medical and Surgical Journal*, 4th March, 1843.)

James George Davey.—E. M., aged 64, suffered from religious insanity. Her first sign of insanity was evinced by a love for theological dispute, which eventually became so excessive that she disturbed religious services by calling the minister to order for the opinions he expressed. She subsequently regarded herself as an apostle, and declared she was an instrument in the hands of Almighty, with which it was His intention to effect extraordinary and great good. Sacred music sent her into ecstasy, and she sometimes fell into paroxysm during the service at the Asylum chapel.

Post-mortem.—The brain and its membranes were apparently healthy with the exception of a circumscribed part in the superior frontal convolution corresponding to the anterior fontanelle, where the tissues were so firmly adherent to one another that the membranes were torn in liberating the brain.—(*Zoïst*, vol. i., p. 38.)

H. Schüle.—"*Mania Religiosa.*"—A labourer, 41 years of age, received, some twenty years prior to admission, an injury on the top of his head which never caused him any inconvenience, though there was a bony deficiency, the size of a florin, and a healed infraction $\frac{1}{3}$ in. behind the coronal suture, and $\frac{1}{4}$ in. from the middle line, corresponding to the superior frontal convolution, which, post-mortem, showed loss of substance (porencephaly), with cystic degeneration of this area and œdema of the surrounding substance. Near the bony deficiency a piece of iron the size of a pea was discovered.

Patient was admitted for mania. Fourteen days after his admission he began the solemn recitation of Biblical sentences with increased excitement, so that he had to be isolated. **He continued to preach fervently in his cell, and gave Bible quotations with a declamatory voice.** His temperature rose. A cold bath reduced it again, and he **then began the preaching anew** with a further rise in temperature and quickened pulse. He got generally exhausted by the morning. The fever and the maniacal excitement of a religious character always went together, and no treatment seemed to prove of avail. He died of croupous pneumonia about three months after admission.—*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874, Case 2.)

John B. Chapin.—*Religious Melancholy.*—E., male, aged 23, single, farmer, no hereditary tendency to disease. Hitherto healthy and industrious. Came voluntarily to the asylum. Devoted to religious subjects and religious life, combined with melancholy. Occasionally a reaction of profanity. He replied to questions in monosyllables, and was never known to engage in conversation.

Post-mortem.—A tubercular tumour, the size of a walnut, was discovered at the vertex of the brain.—(*American Journal of Insanity*, January, 1862.)

Drs. W. A. Browne, J. H. Balfour, and John Reid.—A man who suffered from religious melancholy and died by self-destruction had softening in the right superior frontal convolution, region of anterior fontanelle.—(*The Phrenological Journal*, London, 1840.)

6. "Firmness" and the "Leg-Centre"

"The crown of the head is prominent in persons endowed with *firmness*; while it is level or depressed in the feeble or irresolute." This sentiment of firmness Gall located just in front of the central fissure, close to the median line, in a part of the brain now known as the "paracentral lobule." Gall says: "Such persons plant their legs firmly on the ground."

This is the recognised "leg-centre" of modern physiogists.

To express firmness, we hold the leg stiff and put the foot down. Children when obstinate extend their legs and kick with their feet against the floor.

J. Luys describes the case of a woman, 53 years of age, who had exercised great authority and indomitable will all through her life.

Post-mortem.—The right paracentral lobule was found enormously developed.

Luys goes on to say that he found men with a poorly developed paracentral lobule of little energy, submissive, obedient, with a want of independence; whereas he has seen women energetic and self-asserting, with this lobule highly developed, and that this difference became apparent soon after puberty.—(*L'Encéphale*, 1882, p. 569.)

Robert Dunn.—*Tubercular Deposit in the Brain of a Child in the Para-central Lobule.*—For some time previous to his illness, the parents of the child had been forcibly struck with a change in the disposition of the child, which they had observed for some time to be gradually taking place. From being a happy, placid, and docile boy, he had become more and more petulant, self-willed, and obstinate, very determined to have whatever he set his mind upon, and not to be driven from his purpose; in a word, **he had become a most obstinate and self-willed boy.** So marked, indeed, was the change of disposition that it had become a subject of serious consideration with them whether it was to be attributed to some latent disease under which he might be labouring, or to

mere infirmity of temper. But as he continued to eat, drink, and sleep well, and did not appear to be suffering from any bodily complaint, they contented themselves with endeavouring to correct, by moral management and discipline, what they were inclined to consider rather an infirmity of the mind than of the body.—(*Transactions of the Royal Medico-Chirurgical Society*, vol. xxv.)

W. L. Worcester.—A shoemaker, aged 50, aphasic, demented, and **obstinate.**

Post-mortem.—A spot of softening in the upper part of the first right frontal convolution was the only cortical lesion found.—(*American Journal of Insanity*, October 1896, vol. liii., Case 2.)

Ernest Bischoff.—J. T., 65 years old, a woman, suffering from violent mania, was **stubborn, obstinate,** resisting violently if her wishes were not carried out.

Post-mortem.—Besides atrophy of both temporal lobes, there was a lesion in the left paracentral lobule.—(*Archiv für Psychiatrie*, Berlin, 1899, vol. xxxii., Case 1.)

H. Schüle.—Hy., 39 years old, suffering from furious mania. His disease had started with indecision, which **want of firmness** worried him a great deal.

Post-mortem.—Besides atrophy of the temporal lobes (furious mania), the upper end of the inferior frontal convolution showed a depression on both sides.—(*Section sergebnisse bei Geisteskranken*, Leipsic, 1874, Case 4.)

7. The Functions of the Occipital Lobe

The posterior or occipital lobes are, according to Gall, the seat of the constituent elements of the human affections, such as the enduring love and attachment between parent and offspring, husband and wife, brother and sister, friend and friend; being the foundation of social life. Among the lower animals, in which the posterior lobes are wanting, it has been aptly observed that, except in some cases of sexual union, they seem entirely destitute of sympathy with each other, indifferent to each other's sufferings and joys, and unmoved by the worst usage or greatest pangs of their fellows (Lawrence's *Lectures on the Natural History of Man*). And among them the attachment of the mother to her offspring, how great soever for the time, is limited to the period of its infancy and helplessness; for between them in after life those affections and endearing rela-

tions which are the charm of human society have no existence.

The union existing between love in the bosom of the mother and the mental image of her child is as strong as, if not stronger than, any other association of a moral state with an idea. So strong is this association that almost all kindly feeling, not only in the grown-up woman but in the female child as well, suggests this mental image in some form or other. In the child it takes the shape of a doll. To the childless woman, a dog, or perhaps a cat, supplies the place of the infant which should exist, but does not. On the other hand, the mental image of all forms of helplessness and infancy awaken in the female mind this motherly tenderness.

The love of the mother for her children is indispensable for the maintenance of our species. The lower animals that produce a numerous offspring may carelessly abandon them; but when the progeny is sparse there is no other way to preserve the species than through the greater and more prolonged attention on the part of the parents.

Here is BREHM's observation of the monkey mother:

"When the monkey suckling is unable to do anything for itself, the mother is all the more gentle and tender with it. She occupies herself with it unceasingly, sometimes licking it, sometimes running after it or embracing it, looking at it as though revelling in the sight of it; then she lays it against her breast and rocks it to sleep. When the little monkey grows bigger the mother grants him a little freedom, but she never loses sight of him; she follows his every step, and does not permit him to do everything he likes. She washes him in the brook and smooths his hair with loving care. At

the least danger she rushes to him with a cry, warning him to take refuge in her arms. Any disobedience is punished with pinches or cuffs, but this seldom happens, for the monkey does not do what its mother objects to. The death of the young one is, in many cases, followed by that of the mother from grief. After a fight, monkeys generally leave their wounded on the field; only the mothers defend their young against every enemy, however formidable. At first the mother tries to escape with the young one, but if she falls she emits a loud cry of pain and remains still, in a threatening attitude, with wide-open mouth, gnashing her teeth, and menacing the enemy with outstretched arms."

Whether we term this instinct or affection it is necessary for the maintenance of the species that things should be so.

Welcker found 73 per cent. of female skulls dolichocephalic (long-headed). Richter (Virchow's *Archiv*, vol. cxxvii.) and Broca confirmed the results of Welcker. According to them it would appear that the greater length of the female head, as compared with that of the male, is due to its additional occipital length. Cunningham, according to Havelock Ellis, assigns to women a longer occipital lobe.

Women, speaking generally, are more emotional and less intellectual than men. In harmony with this statement is the observation that women have more brain than men posterior to the great central fissure, and less anterior to it.

Gall records that he had examined with all the attention in his power the skulls of birds, from the smallest size to the largest, and of mammiferous animals, from the mouse to the elephant, and he had found throughout that in the females the cerebral part cor-

PLATE XII.

From Gall's Atlas (reduced).

FEMALE SKULL.

Notice the large **posterior** development.

See also Plate XIV., p. 298.

responding to the organ of maternal love in the human species is more developed than in the males. He said that if there were presented to him, in water, the fresh brains of two adult animals of any species, one male and the other female, he could distinguish the two sexes without ever being mistaken.

Huschke confirmed Gall's observation. Dr. A. Weisbach, in his book *Der Deutsche Weiberschädel* (the German female skull), also certifies to the larger occiput of women as compared with that of men.

A large development of the occipital lobes disposes to ideas of pure love and strong attachment, hence erotomania — ideal love — is the result of overdevelopment, and grief is the result of love combined with the feeling of fear. Persons with prominent occipital lobes are very affectionate, tender-hearted, shed tears easily. "A psychical symptom of the softening of the occipital convolutions that follows hæmorrhage into the vicinity of the pons, for instance, is emotionalism, or loss of inhibitory power over muscles that express the affective states."—(*Journal of Mental Science*, April, 1879.)

Ferrier observed that "the only effect after extensive destruction of these lobes on both sides in a monkey was a remarkable state of depression with refusal of food." Sensation and voluntary motion were unaffected.

Munk says of a dog whose posterior lobes he destroyed: "The sight of men whom he used to greet joyfully now leaves him cold, and even the company of dogs with whom he used to play leaves him unmoved."

Gall found that of twenty-nine women who had committed infanticide, whose brains he examined, this part was very feebly developed in twenty-five. He says:

"Mothers thus defectively organised yield, sooner than others, to any unfortunate circumstances which incite them to crime, because they are not endowed with that lofty sentiment which, in the heart of a good mother, would victoriously revolt against a similar attempt."

Lombroso ascertained the complete absence of love for their offspring in female criminals (though their *libido sexualis* is increased); hence the occiput is short, they have brachycephalic heads.

P. Näcke (*Archiv für Psychiatrie*, 1893) examined the heads of female criminals, and found that those committed for murder had a flat occiput and poorly developed occipital protuberance. In the others — thieves, etc.— the occiput had its normal curve and the protuberance of ordinary size.

Loeb found that after destruction of the most posterior part of the brain (occipital region) of a bitch it neglected its puppies directly after delivery.

Benedikt has described the brains of three murderesses in whom the occipital lobes were short and did not cover the cerebellum.

Yet another observation. Ferrier (*Functions of the Brain*, London, 1886, p. 488) says: "It might be of importance, *in a phrenological sense*, to determine whether there is a relation between the development of this region (the lower postero-parietal area) with the next (the occipital area) and those mental faculties of which sight is the basis." This relationship was known to Emil Huschke, who thus writes: "*The posterior lobes are no doubt in ultimate relation with the emotional life and the sense of sight.* No other sense-organ has such an intimate connection with the tender feelings and grief as that of the nerve of sight, the fibres of which can be traced to the convolutions of

the posterior lobes. Apart from the mimicry of the eye, in which all affections are most vividly reflected, weeping is the best of all proofs."

The above passage was written in 1814, yet our modern brain experimenters claim the sight-centre in the occipital lobe as quite a recent discovery.

Dr. H. Bergmann.—*On the mental derangements due to disappointment in love.* Case A.—Ernestine S., 27 years of age, of a moral character and very romantic nature, fell in love and was carried away by her vivid love-imagination and pure devotion, to which the practical lover not only did not respond but in the end married another girl. Notwithstanding this fact, her love, though he was gone, continued true to him, and she would sit all day sighing for him and whispering his name. Her mind was only occupied with thoughts of love. She died.

At the post-mortem examination the only peculiarity that was found was the prominence of the occipital lobes which projected fully an inch beyond the cerebellum.—(*Zeitschrift für Psychiatrie*, vol. iii., 1846, Case 1.)

The same Author.—Marie B., on admission, 24 years old, had changed in character for about two years. Disappointment in love was the cause, and thoughts of the lover, together with sighing and weeping, were the chief features of her mental state.

Post-mortem.—It was found that the occipital lobes projected considerably beyond the cerebellum.—(*Ibidem*, Case 3.)

Cesare Lombroso.—Strocco, when 16 years old, killed his father and brother, and attempted to poison his mother. He was religiously inclined. He died in the asylum at Reggio of phthisis.

Post-mortem.—Frontal lobe well developed, occipital lobe very defective. Osteophytes in the middle fossa of the skull.—(*The Criminal.*)

O. Hotzen.—*Brain of a "Matricide."*—Marie Köster died at the age of 22 of phthisis. She repented of the crime which she committed at the age of 18. She was a fairly educated woman of a nervous type, wrote a diary, worked in a printing-office and in addition as a needlewoman. She was religiously inclined. **The defect in her character was her active dislike of her parents. One morning, apparently in full consciousness, she killed her mother.**

Post-mortem.—The occipital convolutions were defectively developed, were very small, and did not cover the cerebellum.—(*Vierteljahrschrift für gerichtliche Medizin.*)

W. Charles Hood.—L. D., a female criminal patient, died, aged 66, of exhaustion and the effects of age, after a residence in the hospital of thirty-three years. This woman was tried at Worcester for the crime of **infanticide,** and acquitted on the ground of insanity. During her prolonged residence in the hospital she was uniformly cheerful with two exceptional periods, when she suffered from melancholia, each attack being preceded by febrile excitement.

Autopsy.—A convolution of the occipital lobe of the left hemisphere shrunk so as to leave a vacuity of an inch in length by half an inch wide, occupied by serous infiltration of the pia mater.—(*Journal of Psychological Medicine*, vol. xi., 1858, p. 97.)

David Ferrier.—N. B., housewife, aged 44, suffering from melancholia. "She had not altogether lost affection for her relatives, but had become very irritable, and on **one occasion was about to throw one of her children into the fire.** She had also struck her other children repeatedly in a manner previously unusual to her."

Post-mortem.—Besides a parietal lesion, there was a remarkable belt of wasting and softening involving the superior tier of occipital convolutions and the annectant gyri and adjacent temporo-sphenoidal area.—(*West Riding Lunatic Asylum Medical Reports*, vol. iv., 1874.)

T. S. Clouston.—The patient, J. R., suffered from irascible insanity. **His affection for his wife and family was lost;** he became abusive and violent to them.

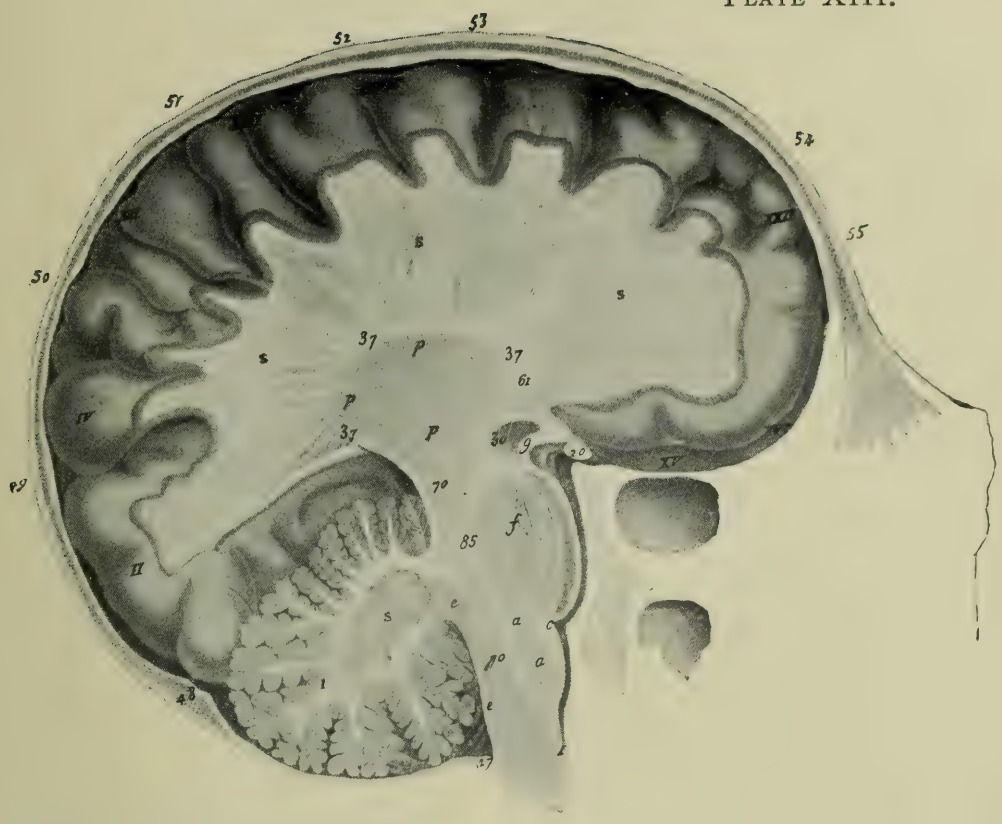
Post-mortem—A tumour attached to right side of cerebellum and involving the occipital lobe at the base.—(*Journal of Mental Science*, July, 1872, vol. xviii.)

Charles Phelps.—This case, which was quoted under "Melancholia," may be again referred to. Case 278, a male, aged 50 years, after a fall, in which the **posterior region of his head** was injured, developed delusions which caused him much distress. The first trouble which came to him was the **fancied death of his wife;** and when, a little later, he became convinced that this bereavement was only imaginary, he was equally positive that another delusion, the **death of his child,** was real. This lasted for many weeks. He suffered acute mental anguish in each instance, which could have been scarce exceeded had these pure fancies been actual facts. An **inclination to weep** was manifested on ordinary occasions, alike without cause as well as when discourse turned upon his family afflictions, but his speech was always coherent. He gradually recovered.—(*Traumatic Injuries to the Brain and its Membranes*, London, 1898.)

S. V. Clevenger.—J. H., aged 42, merchant, had fallen upon occiput when a boy of 12, and suffered frequent pain in this region, growing worse with age. He had hallucinations of sight. His room would be filled with **apparitions of his friends.** No other mental or physical symptom.—(*Alienist and Neurologist*, St. Louis, July, 1888, Case 11.)

Ernest Bischoff.—J. T., aged 65, a woman suffering from violent mania. The one topic of conversation was her children; she was always longing for them, yet when they came to visit her she failed to recognise them.

Post-mortem.—Besides atrophy of both temporal lobes, there was a lesion in the left occipital lobe.—(*Archiv für Psychiatrie*, Berlin, 1899, vol. xxxii., Case 1.)



From Gall's Atlas, 1809 (*reduced*).

VERTICAL SECTION OF BRAIN.

XXVII **Veneration.** XIII **Firmness.** IV **Attachment to home.** II **Attachment to offspring.**

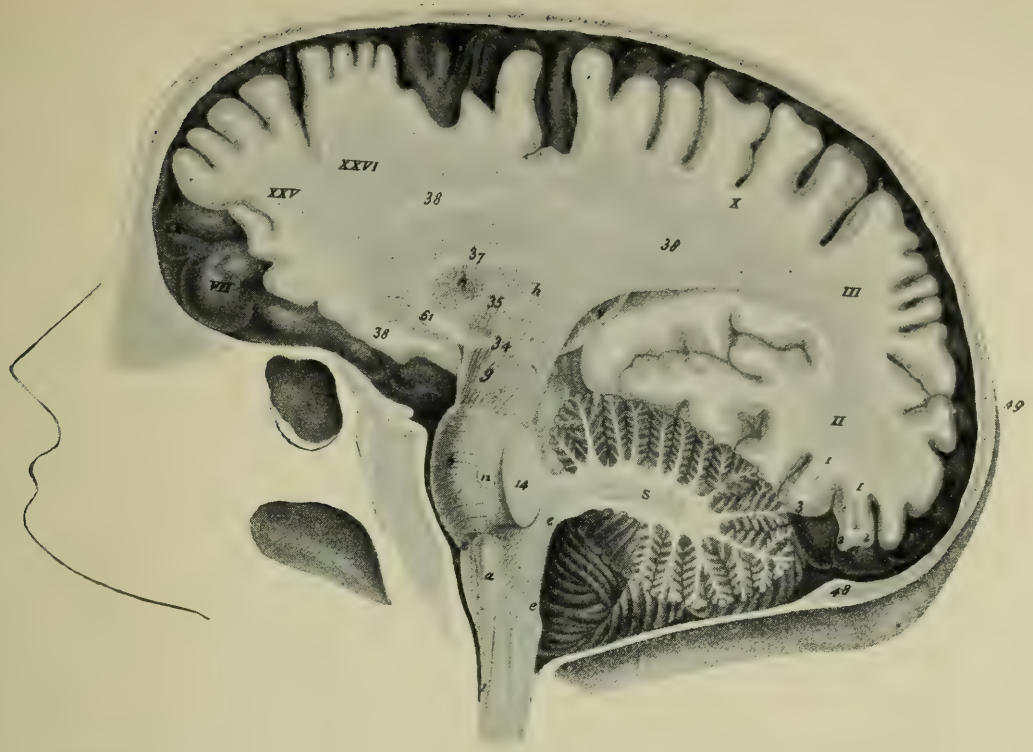
See also lower illustration on next Plate.

H. Schüle.—M. Schill, a hatter, 36 years of age, was borne down by grief at the **death of his youngest child.** His sadness knew no bounds; he could neither work nor sleep; he was unable to concentrate his mind on anything, and became forgetful, so that all his affairs got into disarray. He was in a state of gloomy anxiety. He died of pneumonia.

Post-mortem.—There was yellow infiltration of the superior occipital convolution, and an extraordinary development of the convolution of the calcar avis was observed.—(*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874, Case 3.)

Note

It may seem unlikely on a superficial consideration that the fundamental sentiments and affections have separate centres in the brain, and the data furnished in this chapter may appear insufficient to some to prove such a possibility. Yet it is to be hoped that the evidence adduced will not be neglected. We should remember, as Dr. Buzzard has pointed out, that "physicians were prone not to see what they did not look for. Now they would look for these cases and probably find them."



From Gall's Atlas, 1809 (*reduced*).

VERTICAL SECTION OF **Female** BRAIN.

The occipital convolutions are more completely covering the cerebellum, which is smaller in size than in man.

From Gall's Atlas, 1809 (*reduced*).

VERTICAL SECTION OF **Male** BRAIN.

Notice the depth of the occipital fossæ owing to the larger size of the cerebellum, compared to the female. (Figure XIII in front of the Fissure of Rolando represents the "Leg-centre" or "Firmness.")

CHAPTER VII

THE CEREBELLUM

1 The Functions of the Cerebellum.

(1) Libido sexualis.

(2) Cerebellar ataxy.

(3) The cerebellum in animals.

(4) The effects of castration in infancy.

(5) Other experimental evidence.

(6) The author's observations.

2 One Hundred Cases of Cerebellar Disease.

With excess or loss of the manifestation of libido sexualis.

CHAPTER VII

THE CEREBELLUM

1. The Functions of the Cerebellum

(1.) "*Libido Sexualis*"

IF there is one organ which vivisectors can claim to have re-examined as to the function attributed to it by Gall, it is the cerebellum. And yet they must admit that they cannot say precisely what the functions of the cerebellum really are. So much only is ascertained: that the middle lobe is in some way connected with the co-ordination of movement, while the functions of the hemispheres of the cerebellum are still unknown to them. Tumours of the hemispheres, as long as they do not involve the vermiform process, as NOTHNAGEL has observed many years ago, may produce no apparent symptoms.

It is in these hemispheres that Gall located the sexual desire. About half an inch from the occipital protuberance, towards the posterior edge of the mastoid process, the posterior and inferior portion of the occipital bone forms an arch. The more prominent the arch outwards, the deeper does it descend towards the nape of the neck; the greater the width from one mastoid process to the other, the greater is the size of the

cerebellum. When the occiput is very wide at this region there is a larger surface for the attachment of the muscles, so that the nape of the neck appears rounded, large, and thick, whereas when the cerebellum is but little developed these parts are flat, narrow, and depressed, and although the neck may be thick in its

lower part close to the trunk, it will be narrow between one mastoid process and the other.

If the cerebellum be large, the convexity of the lower fossæ of the occipital bone will be large likewise, and will protrude backward and downward, and the width of the lower part of the occiput between the two mastoid processes will be found increased.

Later on the experiments which have been per-

formed in this region will be referred to, but at the outset I should state that vivisectors not having read Gall's books are mistaken in believing they have disproved Gall because the animal after destruction of the cerebellum remains still in possession of the potentia coëundi. They ignore the fact that the potentia resides in the *lumbar centre* of the spinal cord. In the cerebellum originates only the desire, the *libido*, quite independent of the *potentia*.

Gall did not assert that every vital function concerned in propagation depends immediately upon the cerebellum, but that the *feeling* which prompts to the act is organically dependent upon this structure.

There are three functions involved in this process—sentient, reflex, and secernent.

The first, which involves consciousness, must have an encephalic organ; this, according to Gall, is the cerebellum.

The next—the reflex—must take place through the agency of the appropriate segment of the spinal cord (lumbar region).

And the last occurs through the sexual organs.

When love for the other sex is absent in men or women whose sexual organs are atrophied, the explanation may be sought in the state of those organs; but when this love is absent in people whose sexual organs and glands are normal and performing their functions faultlessly, one must seek the cause not in these organs, but in the nervous system. Libido sexualis can be lost though the potentia coëundi is preserved.

In many of the lower animals sexual intercourse takes place instinctively, and the lumbar centres may be all that is necessary for the fulfilment of the desire.

Moreover, in these the desire exists only during the heat-period.

In man it is a complicated impulse, a co-ordinated desire, which could be resisted.

In accordance with this view the cerebellum reaches in man its utmost degree of size and complexity of structure.

The cerebellum, both in man and animals, is very small at the time of birth, — from $\frac{1}{6}$ to $\frac{1}{11}$ of the weight of the cerebrum,—and increases in size, according to NOTHNAGEL, as one mounts the scale of life.

THEODOR MEYNERT found that the increase of the total weight of the brain after the third decade—when the cortex has reached its absolutely highest weight — depends chiefly on the continued growth of the cerebellum which organ in its absolute weight represents most definitely the scale of age of the rise and decline of manhood.

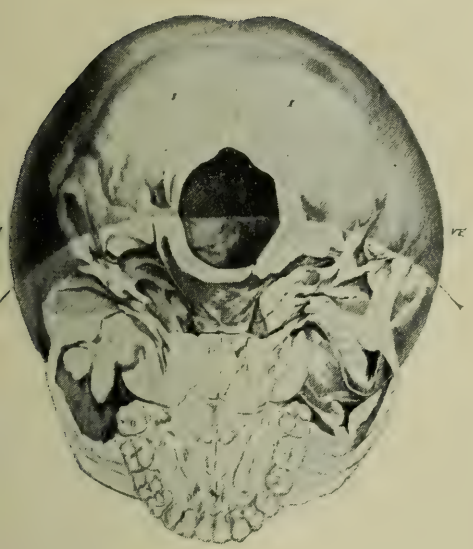
In the new-born infant the cerebellum is the least developed of all the cerebral parts. Its proportion to the brain differs in subjects under 16 years of age. It reaches its full size only in the adult. In an infant the mastoid processes still approach closely towards each other, and there is no occipital swelling. Later the occipital fossæ become deeper and more convex, widening the distance between the two mastoid processes. Before puberty the distance between them is less than the distance between the two parietal eminences; in the adult the two distances are very nearly the same.

Sometimes the sexual organs are prematurely developed in children, having the appearance of those of a grown-up man or woman, but the interest in physical love is non-existent. In BUFFON and other authors we find such examples of children, who presented all the

1

BASE OF SKULL OF A **new-born infant.**

2



BASE OF SKULL
Of a "*woman-hater.*"
(Very small cerebellum.)

3

BASE OF SKULL
Of a man who had suffered from
"Satyriasis."
(Excessively large cerebellum.)

Notice the development of the **cerebellar region** (marked I)
and compare its size with the rest of the brain.
Contrast illustrations No. 2 and 3.

marks of puberty, without anyone having observed in their conduct indications of their being alive to the instinct of reproduction. Gall saw such a girl, only 9 years of age, who appeared to be a completely developed woman, but the cerebellum, judged by its cranial cover, was developed to a very insignificant extent.

Quite the contrary was the case in a boy, 5 years of age, also seen by Gall. He had the bodily growth of a youth of 16, his sexual organs were fully developed, he had a strong beard, a rough and masculine voice—in a word, he presented all the indications of complete virility. *Il avait déjà satisfié ses désirs avec l'autre sexe.* The nape of his neck was very different to that of the girl previously mentioned. It was large, rounded, and strong, although the rest of his head had scarcely attained to the dimensions common at his age. Moreover, he was a child in every other respect.

Gall gives numerous instances of premature desire, of little boys who violated young girls, and so on.

Then there is a third variety, where the desire is premature without the organs being as yet developed.

Charles XII., Newton, Kant, Saint Thomas à Kempis, all show narrowness between the ears, as if they had been little devoted to the fair sex. Charlotte Corday had a small cerebellum. Compare these with the portraits of Mirabeau and Francis I. The latter used to say that "a court without women is like a year without a spring, and a spring without roses."

Many living examples of extremes might be mentioned, would etiquette permit.

The supposed *influence de l'excitation sexuelle sur le cou* is likewise apparent from the ancient nuptial ceremonial. It was customary to measure the neck of the

virgin with a tape previous to the wedding, and again on the following day. If the neck showed an increase in size, *défloration était établie*, whilst if the two measurements were equal, *elle avait retenu sa virginité.* This curious test, which has also been utilised to establish the fact of adultery, has been transmitted to us in the *Epithalamium* of Catullus:

> Non illam nutrix orienti, luce revisens,
> Hesterno collum potuit circumdare filo.

Apollonius of Rhodes, speaking of the passionate love of Medea, says: "The fire which devours her attacks all her nerves, and makes itself felt behind the head in that spot where pain is most poignant when an extreme fervour seizes all the senses." Of olden time artists depicted broad necks for sensual people.

Gall possessed the skull of a Viennese physician distinguished for his great talents, and another of a French abbé who was vain about his appearance and passionately fond of dress and society, who both had a marked antipathy against women, and were known to be continent. The engravings of these skulls are to be found in his *Atlas*, and many others besides, to illustrate his theory.

Eskimo skulls are found to be highly developed in the occipital arch, and their libido sexualis is, notwithstanding the climate, or perhaps in consequence of it, rather active and free.

Gall cited numerous cases of idiots, imbeciles, and cretins who had never shown the least sexual inclination, and in whom the occipital convexity was very small; and others in whom the desire was keen, and whose occipital fossæ were very prominent.

Idiots and cretins have often atrophied sexual organs,

want of development, or other anomalies. Voisin found amongst 150 girls three fourths abnormal. Bourneville and Sollier found 55.4 per cent. At the same time the great majority of cases of atrophied cerebella on record are those of idiots and imbeciles. May there not be a connection between these two observations?

The cerebellum receives little or no attention at post-mortem examinations of normal people.

Gall, of course, had many opportunities of seeing cases of satyriasis and nymphomania. In addition to his own cases he was shown examples by Pinel and Esquirol, who were interested in his theory. Gall criticised the physicians of his own time who sought the morbid manifestation of this instinct exclusively in the sexual organs and castrated such persons. This is practised even up to the present day. He argued that this condition is due to a brain lesion, and is not of a local character. He also points out that erotomania is much more frequently due to excess of secret indulgence than to severe continence.

Morselli has shown that the specific density of the cerebellum increases in the warm season, but not so that of the brain.

If one admits that the cerebellum is connected with the sexual instinct, one might explain the sympathy obtaining between the parotid gland and the testes (metastatic inflammation), and the relation between the development of the beard and the testes, inasmuch as the nervus trigeminus receives some fibres from the cerebellum.

Ferraud, in his treatise *De la Maladie d'Amour, ou Mélancolie Érotique*, affirms that physicians have obtained good results from the application of leeches to the nape of the neck of patients affected with this disease.

Georget, who has so carefully studied the manifestations of the mind in health and disease, writes as follows relative to the point under consideration (*De la Physiologie du Système Nerveux*, Paris, 1821, ii. p. 163):

"I have myself seen, at the Salpétrière, a woman of ardent temperament, whose only mental derangement consisted in imperious sexual desires. Before her entrance into the hospital, *elle avait eu des relations sexuelles dix ou quinze fois par jour.* During her stay she was often seized with a violent pain in the nape of the neck, and at the same time experienced *la libido sexualis très irrésistible et abusait soi-même dix ou quinze fois par jour.* These acts did not appear to injure her, and soon caused the pain in the occiput to disappear."

Henry Head (*Brain*, 1894) finds that the pain and tenderness in disease of ovaries or testes is referred to the occiput.

R. Jamieson located the amative propensity in the cerebellum, and considered deficiency in its size a cause of anaphrodisia.—(Canstatt's *Jahresberichte*, 1843.)

A. Otto is of the same opinion.—(*Journal of Mental Science*, vol. xxii., 1876–77.)

Thos. Laycock agreed with Gall's theory. So does a very recent writer, Enrico Rossi, of Florence.—(*Il Manicomio moderno*, 1891, vol. vi.)

Symes Prideaux observed that the convexity of the lower fossæ of the occipital bone and their protrusion backward and downward has really a connection with the force of sexual feeling.

Lombroso points out the greater development of the cerebellum in female criminals. They possess no chastity.

Dr. Voisin, the distinguished alienist, who adopted phrenology for the diagnosis and treatment of insanity, visited the Toulon prison to study the heads of men confined for crimes on women. Out of 372 prisoners he correctly selected 22 individuals, of whom it was afterwards proved that 13 had actually been condemned for rape, and the other 9 were committed for different crimes, but were kept under special surveillance on account of their sexual proclivities.

Dr. Austin Flint. — "In the numerous cases of disease or injury of the cerebellum to which we have already referred, there are some in which irritation of this part has been followed by persistent priapism and manifest exaggeration of the sexual appetite, and others in which its extensive degeneration or destruction has apparently produced atrophy of the generative organs and total loss of the sexual desire." — (*The Physiology of Man*, New York, 1873, vol. iv.)

The following is taken from Carpenter's *Human Physiology* by Henry Power, London, 1881:

"This doctrine that the cerebellum is the organ of the sexual instinct is not altogether incompatible with the other (muscular movements), and by some it has been held in combination with it. The greater number of phrenologists, however, regard this instinct as the exclusive function of the cerebellum." This is not done, for Gall acknowledged the inco-ordination of movement following lesions of the cerebellum; he located the sexual desire in the hemispheres.

"It is asserted that the results of observation in man lead to the positive conclusion that the size of the cerebellum is a measure of the intensity of the sexual instinct in the individual. This assertion has been met by the counter-statement of others that no such relation

exists. It is unfortunate that here, as in many other instances, each party has registered the observations favourable to its own views rather than those of an opposite character, so that until some additional evidence of a less partial nature shall have been collected, we must consider the question as 'sub judice.'"

"The size of the cerebellum in the different races bears no relation whatever to the degree of *projection* of the occiput." Who said it did? Gall always speaks of the size of the occipital fossæ.

The arguments drawn from results of castration are contradicted on the authority of LEURET, who weighed the cerebellum. They are considered a little farther on.

Dr. Carpenter held that the middle lobe is the centre for the sexual instinct, and the hemispheres for the regulation of the motor function, whereas it is just the other way about. He even brings forward evidence to show how these hemispheres, which are now declared to have no known function at all, develop in youth when complex voluntary movements are being learned by experience.

Farther on Dr. Carpenter says:

"The circumstance, too,"—of which he has frequently been assured,—"that great application to gymnastic exercises diminishes for a time the sexual vigour, and even totally suspends desire, seems worthy of consideration in reference to such a view, for if the cerebellum be really connected with both kinds of functions it does not seem unreasonable that the excessive employment of it upon one should diminish its energy in regard to the other."

(2.) *Cerebellar Ataxy*

The vivisectors have considered the cerebellum as the regulator of muscular movements. When the cere-

bellum is injured, they say, the muscular movements become disordered, the animal can no longer direct them according to its will, or according to the end which it appears to have in project. But similar results are obtained after injury of other parts of the brain. That it does exert an influence on voluntary movements cannot be denied, but this is not its sole function.

Were the cerebellum entirely the centre of association of movement, its development would have to be in relation to the locomotor capacities of animals, but comparative anatomy teaches us that this is not the case.

What relation is there discoverable between the successive stages of development of the cerebellum from the moment of birth up to the twentieth or thirtieth year, and the regularity of the locomotive movements? Are the movements of the man between twenty and thirty years more regular than those of the boy and girl from five to fifteen? Has it ever been proved by observation that individuals possessing a large cerebellum manifest more regular movements than persons in whom it is small? A man possessing a large cerebellum can be extremely awkward.

We must distinguish between the vermiform process and the cerebellar hemispheres. The former is largely developed in the chamois, goat, mule, horse, and other animals distinguished for their agility and security of footstep.

The falling backward in lesions of the cerebellum can at most prove an influence on the exterior muscles of the head, spine, pelvis — just those muscles that enter largely into activity in the sexual act. But it cannot be shown that the cerebellum exerts any influence, for instance, on manual dexterity.

I am aware that cerebellar ataxy differs from loco-

motor ataxy. If I advocate, nevertheless, that there exists a possible connection between the two, it is simply by way of a suggestion for future observers.

First, locomotor ataxy can in most, if not all, cases be traced to syphilis, which means that promiscuous and possibly excessive gratification has preceded. Excesses in venere can be often proved. Hence, why not look to the cerebellum for the lesion, as well as to the cord? This has been done. Ernst Jendrassik wrote in the *Deutsches Archiv für klinische Medizin*, 1888, vol. xliii., "On the Localisation of Tabes Dorsalis," and described the morbid changes in the cerebellum of ataxic patients.

Jellinek described the microscopical appearances of the atrophy of the cerebellum in tabes dorsalis.

Even "general paralysis" may have a connection with the cerebellum. At least, J. Luys (*Recherches sur le Système Nerveux*) states that in all the autopsies of cases of general paralysis made by him, he found the grey substance of the cerebellum to be diseased in a more advanced degree than the cerebral convolutions.

Adolf Meyer (*Archiv für Psychiatrie*, 1889, vol. xxi.) showed atrophy (a sclerosis) in the hemispheres of the cerebellum in general paralysis.

(3.) *The Cerebellum in Animals*

Gall called attention to the differences in desire amongst animals of the same species, and narrated anecdotes of dogs, bulls, stallions, and rams whose activity in this direction he had pointed out to breeders.

He observed an increased turgescence of the cerebellum in animals killed in the moment of heat, as

compared to the cerebella in animals destroyed at some other season.

On all animals that multiply rapidly, and propagate several times a year, the cerebellum is in general very largely developed, regard being always had to the size of the brain. Rats and mice have a very large cerebellum. See also the plates, in Vimont's *Atlas of the Comparative Anatomy of the Brain*, of the cat, hare, squirrel, guinea-pig, mole, etc.

It has been objected that birds possess only the middle lobe of the cerebellum, and yet present a great activity of the organ of reproduction. Speaking generally, this assertion is far from being correct. A very considerable number of species of birds experience the impulse of love but once or twice in the year, the solitary exceptions being certain domestic species, which are well fed and protected from inclemency of the seasons. True, a single cock in a courtyard is sufficient to serve several hens, but we shall see on comparing the cerebella of cocks of different amorous capacity that they differ in size. Probably the cock recruits his strength more rapidly by the greater abundance and more nutritive quality of the food which he finds in the courtyard than in the wild state.

(4.) *The Effects of Castration in Infancy*

Whatever male animal, man included, has undergone castration *in early infancy*, acquires female forms; that is to say, the beard does not grow, the throat is not developed, the voice remains high, etc. In roebuck stags the animal no longer cuts horns. Everyone is acquainted with these phenomena, but not with the fact that the cerebellum is also retarded in its

growth, and consequently the occipital fossæ remain small throughout its dimensions.

When the cerebellum is already developed to a certain extent, then the sexual desire will still manifest itself, and its exercise will be possible. In course of time, however, even then, the cerebellum may show some atrophy and the convexity between the two mastoid processes may grow flatter or narrower, or a deposit of bone take place on its internal surface.

Complete castration produces a remakable diminution in the cerebellum, and, after a sufficient lapse of time, causes a diminution of the volume of the nape of the neck. From this arises the difference which exists between the nape of the bull and that of the ox.

Unilateral castration causes a diminution of the lobe of the cerebellum lying on the side opposite that on which the operation was performed.

When castration takes place in an adult after the complete development of the generative organs, he continues to form erotic ideas, whereas he entertains none if the operation has been performed before puberty.

Gall had several rabbits castrated, some on the right side and others on the left. He killed them six or eight months after and found, without exception, the opposite lobe of the cerebellum smaller in size and the occipital convexity flatter.

The muscular system preserves a greater volume and more energy in animals which have been castrated after the evolution of the genital organs than in those that have been mutilated before it. If one wishes to have a strong horse, for example, it is usual not to subject him to castration until after he has completely developed. In such case, the falling in of the nape of

the neck never goes so far as if the operation had been performed previous to the evolution of his generative system, although it does take place to a perceptible extent.

(5.) *Other Experimental Evidence.*

N. M. Wasiloff of Moscow noticed:

1. On stimulation of the cerebellum a protrusion and sinking of the eyeballs ensues.

2. In lesion of the cerebellum, muscular fatigue.

3. On total extirpation shyness, and desire of being left alone.

Lesions of the cerebellum produce asthenia, so does the manifestation of its function.

Budge (*Untersuchungen über das Nervensystem*, No. 2, p. 82) made the discovery that in females irritation of the cerebellum caused movements of the cornua of the uterus and tubes. He also found that a like exciting cause produced, in the male, movements of the testes and vasa deferentia.

Valentin confirms Budge's observations, and Romberg (*A Manual of the Nervous Diseases of Man*, Sydenham Society's translation, vol. ii., p. 33) quotes them with evident approval.

Spiegelberg has made the same observations.

Serres located the amative propensity in the middle lobe, but since this part is rarely diseased without involving the hemispheres he was probably wrong in his deduction. He plunged knives and probes into the cerebellum of oxen, stallions, and guinea-pigs, and produced priapism.

Marshall Hall and Segalas observed the same.

But even if the electric current or some other ex-

citation of the cerebellum, or its extirpation, produced no physical effect on the organs in question it should not surprise us, for in the cerebellum resides only the feeling or idea, and the physical signs and symptoms are produced through its connection with the lumbar region. Electrical irritation of the gustatory centre or centres of hunger or thirst, as shown in Chapter IV., p. 208, does not excite movements of the stomach, as far at least as we know.

Experimenters who admit that there must be a centre somewhere in the brain for the sexual instinct, do not disprove the cerebellar theory by showing that animals deprived of the cerebellum are still capable of propagating their species; for if the cord be cut just above the lumbar region, the animal will still be able to carry out the act, the particular centre remaining still intact. That the irritation need *not* amount to a *sensation* was already declared by Carpenter, who also showed that this act in the frog is chiefly a reflex action, and not an exalted sensibility. "If the head of a male frog be cut off during the congress (which lasts for some time), his embrace will not be relaxed, and will even continue until the body of the female is becoming gangrenous from the pressure."

Luciani's result of experiments that the cerebellum is not necessary for coition only confirms what is known as regards human beings, that the *desire* for intercourse is not essential to the act, or to conception. Conception may take place during a swoon, drunkenness, or under other influences which abolish consciousness. Coition accomplished by violence, or the embraces of a man who excites disgust or even horror in the woman, may be followed by conception. There are women who at no period of their lives have felt the slightest inclina-

tion towards men, and who cannot comprehend how a man can inspire a woman with any feelings different from those excited in her by a brother or another woman, who have never yielded to the embraces of their husbands but from a sense of duty, and who, although they have borne several children, have never experienced the least sensation of pleasure.

Coition inspires some persons only with repugnance and disgust; they look upon those who attach any importance to it as sensual beings, debasing themselves below the level of brutes; yet these same individuals show not the least difference in the external organs of generation to distinguish them from other men and women. Let their cerebellum, however, be examined, and its feeble development will at once be detected.

Everyone is aware that there is no proportion between fecundity and the inclination to sexual intercourse. Moreover, there is no relation between the sexual desire and sexual power. The sexual desire continues often very strongly, even morbidly, in men totally impotent.

Luciani extirpated the cerebellum in a bitch. The animal manifested "heat" at the usual autumnal period, though the act could not be effected owing to the motor instability. Why should it not manifest heat if the lumbar centres are intact?

Luciani's animals seemed positively eager for the other sex after their cerebellum had been mutilated. May it not be that such mutilation proved an exciting agent of the cerebellum?

The ablation practised by Luciani may irritate the function of the cerebellum. Thus Magendie was struck to find so many cases of irritation of the generative

apparatus coinciding with atrophy or more or less destruction of the cerebellum.

Leuret made many investigations to disprove Gall's theory to the effect that castration before puberty causes atrophy of the cerebellum. First of all it is wrong, perhaps, to say "atrophy," inasmuch as it may prove merely arrested development. Secondly, Leuret *weighed* the cerebella, whereas Gall *measured their size.* Now it is quite possible that the size of a cerebral organ may diminish without its weight diminishing; the size may even diminish and the weight increase, as in sclerosis.

Leuret weighed the cerebella, Gall measured them; a future experimenter will perhaps take the specific gravity. But an accurate observer will take all three. The experiment must be performed on animals before puberty.

Goltz thinks it is a mistake to hold still to Gall's idea that the cerebellum is the seat of sexual desire; for he says, after extirpation of a large portion of the *middle* lobe of the cerebellum, he found the dog still to have an active desire, though his movements were characteristic of cerebellar lesion.

He did not destroy the lateral lobes. What is the value of this experiment when compared with another of his where the propensity was preserved even after section of the lumbar cord opposite the first lumbar vertebra?

(6.) *The Author's Observations*

I submit a large number of cases of cerebellar disease in which the libido sexualis and potentia coëundi were involved. It may be objected that a much larger number of cases might be adduced in which no connection,

as indicated, has been shown. My reply to this is:

1. That the connection can be proved only in men, rarely in women.

2. That inquiries are rarely made in this regard, out of a false sense of propriety. If the inquiry be made delicately, as every physician would do, he is sure to get the needed information from the patient, his wife, or their friends.

Whenever I had cases of tumour of the cerebellum under my charge, I profited by the occasion. As a result, I may state that I found, coincidently with the onset of the disease, even in quite young married men, all thoughts about marital intercourse had left them. Sometimes it happened that, previous to the extinction of the libido sexualis, the patient experienced an increased desire. Chronic disease of the cerebellum, as in the case of any other organ, may suspend its function.

Physicians who in their practice come across cases of children who, before the average age of puberty, manifest unusual sexual development and desire, should never fail to observe the size of the head between the two mastoid processes, that is to say, the increased curvature of the occipital fossæ.

Old men sometimes preserve their vigour in this direction wonderfully, and in them the convexity of the occipital arch becomes more apparent owing to the nape-muscles being wasted. The libido may exist, however, in these old men, without the lumbar centre being able to respond to it; such men will, all the same, carry on flirtations which may earn for them the title of "old fools."

Those individuals in society whose delicacy is most sensitive when allusions are made to the sexual feeling,

are *not* those who have a small cerebellum, and in whom the feeling itself is most weak. Such persons, although their intellect be good, are dull in apprehending such allusions when veiled; and when the expressions used are too distinct to be misunderstood they appear to them to partake as much of the character of impertinence as of indelicacy.

On the contrary, when the cerebellum is large, and the corresponding feeling strong, in combination with large organs of the moral sentiments, which furnish purifying and controlling motives, persons so constituted are *extremely sensitive* to indelicate allusions. They *divine them*, even when shrouded in the most studied ambiguity; they *understand their nature*, and might relish them but that their moral feelings condemn them, and from this conflict and condemnation results the *sensitiveness* of their minds in regard to such topics.

When the cerebellum is very large and the moral organs are latent, there is a want of delicacy corresponding to the absence of the purifying and controlling powers. The individual is then very much in the condition of the lower animals in regard to such feeling.

I can honestly affirm that my experience has never failed, and could cite examples of men and women, some of well-established reputation and of high moral character, with exceedingly great, and others again with very small libido sexualis, and with the occipital convexities developed accordingly.

2. Cases of Cerebellar Disease

Professor Moriz Benedikt.—*A medico-legal case.*—Hugo Schenk, whose trial caused a great sensation in Vienna some years ago, was accustomed to form *liaisons*

with old and ugly cooks, and when he grew tired of them, which was usually very soon, he sometimes murdered them. Sometimes his victims were young and honest girls of whom he also soon grew tired. He was handsome, very intelligent, and an excellent talker. *Sa vigueur sexuelle était extraordinaire*, and being of a lazy disposition he exercised it for a living. He was executed at the age of 36.

Post-mortem.—The whole brain weighed 1455 grammes; the cerebrum 1261 grammes, the cerebellum 194 grammes, whereas the average weight of the cerebellum for men, according to Sir James Crichton-Browne, is 147 grammes.—(*Archives de l' Anthropologie criminelle*, 15th May, 1891.)

Giuseppe Mainardi.—*Medico-legal case. A homicidal and satyriacal maniac.*—Giovanni Grassi, a wholesale murderer, 23 years of age, was transferred from prison to the asylum, where he died after eighteen months. This is his confession:

"Always quarrelling with my brother, who threatened my life, I was in fear of him, had sleepless nights, and kept a knife hidden in my bed for protection. *Pendant une nuit j'avais eu un désir pour ma cousine, une jolie fille, qui dormit dans l' étage au-dessus du mien.* I went up-stairs, knocked at her door under pretence that I wanted a clean night-shirt from the wardrobe in her room. She refused to open the door, whereupon I went back to fetch my knife and to get a ladder to mount up to my cousin's window, *en ésperant de pouvoir l'outrager. Mais elle me résistait violemment et criait très fort.* In my anger I thrust the knife ten times into her breast and abdomen. As I was opening the door to get out, her father appeared and asked me with threats what I was doing there; without hesitation I stabbed him twice so that he fell dead on the stairs. As I went down-stairs, came another uncle who, like the previous one, spoke angrily to me and threatened

me, whereupon I took him by the throat and killed him with two stabs. Then I returned up-stairs and fetched three sheets to cover up the three corpses. Then I went out into the yard and called the wife of a labourer *qui aimait toujours mes embrassements et l'invitait de satisfier les désirs que ma cousine ne voulait pas satisfaire.* While I was waiting for her to get ready, I saw my father coming towards me with a piece of timber, and imploring me with tears to throw away the knife, which was still dripping with blood. I made a leap to attack him, but he gave me a blow with his piece of wood. Since, however, fathers never strike hard for fear they might cripple their children, he only caused a contusion on the shoulder, and I had time to thrust the knife into his side. Thinking I had killed him I went into the ox-house to stab all the cattle; but think of my misfortune! The point of my knife was bent, and my stabs were in vain. Hearing noisy voices in the yard I got out to look for the cause, and saw a number of farmers who surrounded me and tried to strap me with ropes. I used my fists freely to escape, and ran up the street; they followed me. Seeing that they were likely to catch me up I tried to escape over the fields and jumped over a load, but I slipped and fell into the water up to the neck. Then it became easy for them to catch me and take me off to prison."

Post-mortem. — Unsymmetrical basis of skull, supernumerary convolution and softening of the base of the brain, with *complete softening of the grey matter of the cerebellum.*—(*Allg. Zeitschrift für Psychiatrie*, 1873, vol. xxix.)

Gall.—A young man, 21 years of age, complained of pain in the posterior part of his head on the right side. He preferred lying on his back. There were no signs of paralysis. His sensation, on the other hand was reduced. Patient lost the potentia coëundi.

Post-mortem.—There was a tumour in the right hemisphere of the cerebellum.—(*Fonctions du cerveau*, vol. iii., p. 297.)

The same Author gives numerous other cases of injury, disease, and atrophy of the cerebellum, all supporting this theory. He also quotes

Giovanni Boccaccio (1313–1375).

Writer of novels of a **worldly** character, the **love-element** predominating. Notice the development of the *occipital* and *cerebellar* regions of the head.

Compare this head with that of *Calderon*, Plate XI., p. 274

cases of apoplexy of the cerebellum without any signs *de dérangements sexuels*, and says that probably this depended on the locality of the lesion.—(*Ibidem.*)

Baron Larrey (quoted by Gall).—A soldier was accidentally castrated on the right side in an operation for rupture.

Post-mortem.—The left hemisphere of the cerebellum was found atrophied.—(*Ibidem*, vol. iii., p. 587.)

Baron Larrey.—In support of Gall's theory, Larrey cites the case of a young soldier, who, in Egypt, was struck on the back of the head by a large splinter of wood. Inflammation of the cerebellum supervened. Some years after patient came again under Larrey's observation, when it was found *que les parties génitales étaient réduits aux dimensions des organes d'un enfant d'un âge de quelques mois.* Potentia coëundi and libido sexualis were lost.—(*Observations on Wounds.* Translated from the French by E. F. Rivians, M.D., Philadelphia, 1832.)

The same Author.—In another case, a soldier was struck by the ball from a blunderbuss, which, grazing the occipital protuberance, tore away the extensor muscles of the head in its passage from one side to the other. The patient immediately felt a violent pain in the occiput, and a sense of weight in the whole head, together with numbness of the lower extremities. His vision and hearing were so much impaired that he could hardly discern any large object or apprehend the most piercing sounds. *Grande atrophie des parties génitales et perte complète de puissance sexuelle.—(Ibidem.)*

The same Author.—The third case was that of a man who had received a sabre cut through the occipital bone and dura mater, so that the right lobe of the cerebellum could be readily seen and touched. When the finger was pressed upon it, ever so gently, vertigo, syncope, and convulsions were induced, but no pain was experienced. After the first few days the patient lost the faculties of vision and hearing on the right or affected side. At the same time there was violent pain along the course of the spine *et une sensation de formication de testicules, et atrophie à la dimension de petites fèves. La passion sexuelle avait cessée.—(Ibidem.)*

The same Author.—In the fourth case, the patient was struck on the back of the head; among other consequences, *atrophie de la testicule droite et perte de puissance sexuelle.—(Ibidem.)*

The same Author.—In the fifth case, in consequence of a blow on the head with a piece of wood, an abscess of the right lobe of the cerebellum was produced, from which, in about three months, the patient died.

The post-mortem examination revealed the existence of an abscess which had entirely taken the place of the left lobe of the cerebellum. *Grande atrophie des parties sexuelles.*

The same Author.—Two other cases are cited, *de lésion de testicules avec atrophie du cervelet.—(Ibidem.)*

Dannecy.—Jean Michel Brigaud, who two years before his death

underwent unilateral castration for a sarcocele on right side, was found to have, post-mortem, the left lobe of the cerebellum atrophied.—(*Annotations pathologiques de l'hospice de l'Ecole de Médicine de Paris*, 15th July, 1817.)

Dr. Fossati.—A case communicated by Professor Metaxa of Rome of a lady who was continent till old age, when suddenly she gave way to extreme dissipation. She died of abscess of the cerebellum.—(*Journal de Phrénologie*, Paris, vol. v., p. 311.)

M. Serres.—One night a man, 32 years of age, was brought unconscious by the National Guard to the Hospital Hôtel Dieu. The patient was put to bed, when it was noticed *que ses organes sexuels étaient dans un état de chaleur et de priapisme.* This condition remained for several hours. He died the same night. It was ascertained afterwards *qu'il est mort pendant coït avec une prostituée et pour l'excitation de son désir sexuel*, he had taken a preparation of cantharides and made himself drunk in addition. The dissection took place in the lecture hall before the students. There was no lesion in the hemispheres of the brain. The entire cerebellum showed signs of inflammation.—(*Journal de Physiologie Expérimentale* (Magendie), 1882, Case 1.)

The same Author.—Thomas Marie-Anne, aged 55. A very similar case. Patient had violent satyriasis, and died of apoplexy.

Post-mortem.—Hæmorrhage in the central part of the right hemisphere of the cerebellum.—(*Ibidem*, Case 2.)

The same Author.—Nicolas Bourgoin, aged 46. Another case of satyriasis and death by apoplexy.

Post-mortem.—The cerebellum was congested.—(*Ibidem*, Case 3.)

The same Author.—A man named Gambar, 52 years of age, who had died from an apopletic stroke, and in whom priapism and turgescence, almost to the extent of gangrene, were observed, had hæmorrhage into the corpus striatum, and the right hemisphere of the cerebellum contained a large blood-clot.—(*Ibidem*, Case 4.)

Case 5 is identical with the previous one.

The same Author.—Case 6, a man, much devoted to the fair sex. Same history of apoplexy. The priapism continued notwithstanding the application of ice.

Post-mortem.—The cerebellum was considerably larger than normal, and there was a hydatid cyst found in it.—(*Ibidem.*)

In all the above cases the face was found red and hot, and the body cold. Serres says that physicians have not discovered this relationship between libido sexualis and cerebellum sooner because they omitted to look in the cerebellum for the seat of the disease. We are living eighty years after his time, and this remark still holds true.

The same Author.—A case of chronic cerebellitis.—M. J. Dubourg, aged 33, needlewoman, started early with excesses of this instinct. She menstruated in her eighth year, and had since lived in one of the worst houses of ill-repute, where scandalous practices took place. When she

was 29 she cared no more for men, *mais elle s'était devoué aux passions virulentes d'abus de soi-même.* Recognising the evil, she went in for the violent treatment of cauterisation in the hope of quenching her erotic mania, but of no avail. The desire remained as intense as ever. She became imbecile at 32, and died the following year of phthisis.

Post-mortem.—There were old hæmorrhages and ulcerations in the cerebellum ; the whole substance was atrophied ; the arteries were abnormally dilated. All the pelvic organs were congested.—(*Ibidem*, Case 7.)

M. Combette.—Alexandrine Labrosse, who died in her eleventh year, was always weak in her legs, and could only walk when 5 years old. Her development corresponded, alike physically and mentally, to a girl of 6 years. *Abus constant de soi-même.*

Post-mortem.—The occipital fossæ were filled with serum ; only a membrane to be seen in place of the cerebellum.—(*Ibidem*, January, 1831, vol. xi.)

Dr. Guiot.—Patient who showed, post-mortem, hæmorrhage into cerebellum, had continuous priapism since the apoplexy.—(*Clinique des Hôpitaux*, vol. i., No. 70.)

Dr. Romet.—A woman, 70 years of age, recommenced her monthly periods, which had ceased years before.

Post-mortem.—There was hæmorrhage into the cerebellum, and the uterus, Fallopian tubes, and ovaries were congested.—(*Revue Médicale*, 1824.)

Dr. Mignot found continuous priapism in a young man, 25 years of age, in whom the necropsy revealed a cyst, the size of a hen's egg, in the left hemisphere of the cerebellum.—(*Gazette Hebdomadaire*, 1875.)

Dr. Bennett.—The subject of his observation was born in the year 1815, and at the time of birth presented no abnormal appearance, but soon after a portion of the cerebellum projected through an opening in the cranial parietes ; the tumour being the size of a hen's egg at the age of 6 years. Whenever a slight pressure was exercised on the projecting mass, the child immediately lost consciousness, and on recovering, complained as if she had been struck roughly on the head. Up to this period she enjoyed perfect health, the intellectual and other faculties were developed in a regular manner. There was no modification whatever of the sensibility or mobility ; however, another phenomenon was observed. At the age of 11 the first symptoms of libido sexualis showed themselves. The girl was seized *avec un désir indomptable pour des hommes, et tous les efforts de sa mère ne servaient à rien pour prévenir libertinage et abus de soi-même.* This state of passion continued unabated up to the age of 17, when she died suddenly.

The examination of the tumour after death showed that a portion of the cerebellum, enormously developed, had projected through a deficiency in the osseous case of the cranium.—(*Gazette Médicale*, 1834.)

D. Payen.—A melancholic girl, 10 years of age, addicted to *abus de soi-même*, died of tubercular softening of the cerebellum.—(*Essais sur l'Encéphalite*, 1826, p. 25.)

Dr. Caffort.—Patient, 25 years of age, suffered with satyriasis. Sedative and hygienic treatment proved of no avail.

Post-mortem.—The grey substance of the cerebellum was softened, almost fluid.—(*Archives Générales de Médicine*, 1830, p. 133.)

M. Thisu.—A cow after being delivered of a calf had no milk, and was never in heat afterwards. She held her head to the left, and when walking her body leaned to the left. After one month's illness the cow died, and the cerebellum was found totally disorganised by suppuration.—(*Ibidem*, 1827, vol. xii., p. 288.)

Dr. Pégot exhibited at a meeting of the Anatomical Society a tubercular mass found in the cerebellum of a young man of 19 years, *qui avait eu priapisme presque constant* and *avait abusé soi-même.*—(*Ibidem*, April, 1834, vol. iv.)

M. Andral quotes Dr. Sorlin's case, where a tuberculous mass pressed on the right lobe of the cerebellum, and the patient had permanent priapism during his illness.

Moulard Matin.—Described as one of the symptoms which occurred late in a patient who had a cancerous tumour of the fourth ventricle growing towards and pressing on the cerebellum, though not involving it: *impuissance instantanée des organes sexuels d'un jeune homme âgé seulement de* 23 *ans.*—(*L'Union Médicale*, 4th June, 1868, p. 837).

Dr. Hospital.—A case of erotic mania with a lesion in the right cerebellar hemisphere. — (*Annales Médico-Psychologiques*, 1875, vol. xiv., p. 252.)

J. B. F. Girardin.—Patient, aged 42, suffered for some time with violent priapism, which was probably the cause that he spent the nights away from home. One day his wife quarrelled with him about the impropriety of his conduct; he got into a violent rage, left the house, and was brought back unconscious. There was still priapism.

Post-mortem. — The anterior part of the cerebellum was eroded, and showed blood clots, a large one in the middle of the right hemisphere.

M. Martineau exhibited at a meeting of the Anatomical Society of Paris a cerebellar tumour, taken from a patient, Jacques R., aged 60. His illness lasted about two years. There was headache, inco-ordination of movement, falling forwards. No paralysis, no convulsions, nor vomiting. All his senses were intact, he had an excellent memory, and his intellectual faculties were quite normal. But one symptom in the patient attracted attention, i. e., *une vigueur sexuelle exagérée.* Although 60 years of age, he noticed that about the same time as his difficulty of walking occurred, *il sentait la nécessité de voir sa femme tous les deux jours et de répéter l' acte quelquefois en succession. Il essayait de se contrôler, mais sans succés. Malgré cette indulgence excessive*, he grew very stout. He died of congestion of the lungs.

Autopsy.—Brain normal. The cerebellum was very much congested. There was a fibrous tumour in the middle lobe of the cerebellum, affecting the hemispheres by pressure and by the inflammation it set up. —(*Bulletins de la Société Anatomique de Paris*, July, 1859, vol. xxxiv.)

M. Bordier.—Case of a boy, 15½ years of age, who had a hydatid cyst pressing so much on the right hemisphere of the cerebellum that it was

shifted considerably to the left side. *Constant abus le plus éffréné de soi-même.*—(*Ibidem*, May, 1865, vol. xl.)

Dr. Bottentuit. — Darche, 43 years old, admitted for a simple gastric trouble, became after eight days eccentric *et abusait soi-même con stamment.*

Post-mortem.—Hæmorrhage into right occipital fossa.—(*Ibidem*, 1869, vol. xliv.)

M. Larrey showed to the Anatomical Society of Paris a cerebellum with unilateral atrophy, taken from a man on whom Larrey's father had performed one-sided castration twenty years before.—(*Ibidem*, 1830, vol. v.)

Fr. Meschede. — Natalie X., 17 years of age, a pyromaniac, *d'une excitabilité sexuelle très forte, indulgente aux manipulations obscenes et manifestant son désir dans une manière perverse déjà longtemps auparavant du commencement de ses menstrues d'un âgé de quatorze années.*

Post-mortem.—The cerebellum was so much atrophied that the occipital lobes projected considerably.—(*Allg. Zeitschrift für Psychiatrie*, 1873, vol. xxix.)

Millenberger and Robin.—A young man, 21 years of age, had a tumour, size of a pigeon's egg, in the right cerebellar hemisphere. *Impuissance sexuelle complete.* Sudden death.—(*Gazette de Paris*, 1855.)

Clovis Gallopin.—Louis Cheval, aged 61, admitted for violent mania and a tendency to obscene acts.

Post-mortem. — Pia mater injected over left hemisphere of cerebellum. Temporal lobes softened.—*Annales Medico-Psychologiques*, September, 1879, Case 2.)

Dr. Muhr.—Ludwig Schw., 47 years of age, a doctor of law, a man of great intelligence, who spoke five languages, from his earliest youth wanted to become a monk, but achieved his desire only when having reached his thirty-sixth year. He always loathed the normal gratification of this instinct, but followed its perversion, especially during his religious devotions, when he had hallucinatory intercourse with women-saints. He died of phthisis.

Post-mortem.—The left cerebellar hemisphere was quite atrophied, and the corresponding portion of occipital bone depressed.—(*Archiv für Psychiatrie*, 1875, vol. vi.)

A. Otto.—Joseph Degler, a handsome, well-built man, with excessive libido sexualis, attacked women in the public streets. In addition, he was given to perversions of this instinct. His whole life seemed devoted to its gratification.

Post-mortem.—The hemispheres of the cerebellum were wasted and asymmetrical. The left was considerably smaller than the right one. The vermiform process was normal.—(*Ibidem*, vol. iv. p. 730.)

E. Hitzig.—A case of one-sided defect of the cerebellum. The patient, a woman, 32 years of age, had never any troubles as regards her balancing power and movements of limbs; on the contrary, she learned to walk as soon as other children, and was fond of jumping and dancing. On the other hand, she had many "liaisons" before her marriage, showing an active libido sexualis.—(*Ibidem*, 1884, vol. xv., p. 266.)

C. G. Carus found an abnormal occipital development corresponding to the cerebellar region in a little girl aged 4 years, who had men-

struated since she was 2 years of age, and had the breasts and labia (*avec cheveux noirs*) such as would be found in a virgin of 16 years of age. The girl was taken to Dresden and examined by Professor Beck and Professor Seiler.—(Canstatt's *Jahresberichte*, 1842, p. 22.)

Her case is also quoted.—(*Allg. Zeitschrift für Chirurgie*, 1842, and *Neuestes. u. Wissenschaftl. aus der gesammten Medizin*, No. 17.)

Dr. Persille. — Tubercles in the grey substance of the cerebellar hemispheres of a patient who suffered with constant priapism.—(Oppenheim's *Zeitschrift*, November, 1849.)

P. Riffortz.—A similar case.—(*Journal für Chirurgie*, 1835, vol. xxiii.)

N. Friedreich.—Another case of cerebellar tumour and priapism. —(*Intracranial Tumours*, Case 6.)

H. Immermann.—Gustav Strobel, 24 years of age, in whom was found, post-mortem, a tumour in the occipital fossa compressing both cerebellar hemispheres, which were so soft as to dissolve on handling them. Besides giddiness, vomiting, pain at the back of the head, noises in the ear, choked disc, and slight paresis of the glossopharyngeal and facial nerves, patient complained of, and was observed to have, especially at the beginning of his illness, constant priapism. —(*Berliner klinische Wochenschrift*, 1st May, 1865.)

Wilhelm Ebstein describes the case of a prostitute, 44 years of age, with a large osteoma 4.5 x 3.2 x 2.9 cm. in the left hemisphere of the cerebellum, without any mental, motor, or sensory symptoms, who died with symptoms of œdema of lungs.—(Virchow's *Archiv für Path. Anatomie*, vol. xlix., p. 145.)

Dr. Steiner records the case of a woman, 31 years of age, with erotic excitability, who had three tumours in the posterior fossa of the skull, partly embedded in the cerebellum.— (*Wiener Med. Wochenschrift*, vol. xx. 1870.)

H. Schüle.—C. Eckenfels, 30 years of age. Excesses in venere.

Post-mortem.—Purulent meningitis at the base of cerebellum. (*Sectionsergebnisse bei Geisteskranken*, Leipsic, 1874.)

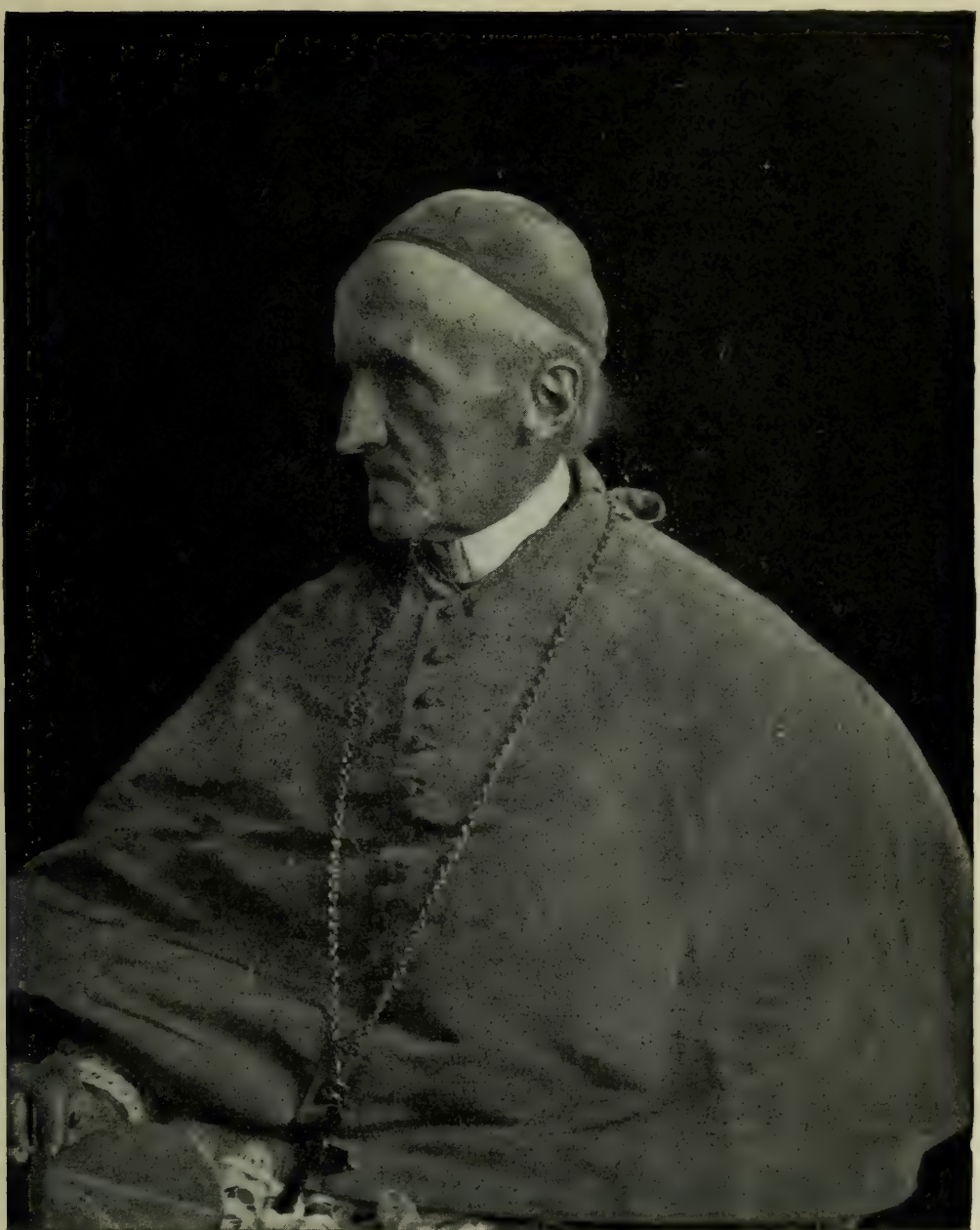
Dr. Fiedler recorded a case of arrested development of cerebellum with total absence of sexual desire.—(*Zeitschrift für rationelle Medizin.*)

Robert Bahrdt described the case of a boy who, after primary tuberculosis of the testes was found, some months after, to have tubercular degeneration of the cerebellum, which led to his death.—(*Jahrbuch für Kinderheilkunde*, Leipsic, 1874, vol. iv., p. 86.)

Dr. Eisenchütz.—Cerebellar tumour in a girl of 8 years of age. *Abus de soi-même.*—(*Jahrbuch für Kinderheilkunde*, and *Vierteljahrschrift für Psychiatrie*, 1868, vol. ii., p. 174.)

Hermann Demme.—A soldier received at the battle of Magenta a shot which fractured the basis of the occiput. Consciousness did not return. No paralysis. There was priapism preceding death.—(*Militärchirurgische Studien*, Würzburg, 1864.)

F. Obernier gives as one of the symptoms of a typical case of a tumour



Cardinal Manning.

Who led an **ascetic** life. Notice the enormous extent of the frontal lobes, particularly superiorly in the region of *veneration* and the *altruistic sentiments*. (Chapter VI.)

of the cerebellum in a patient, 43 years of age, diminution of the potentia sexualis.—(*Tumours of the Brain ;* Ziemssen's *Handbuch*, Leipsic.)

Dr. Dunglieson found that inflammation of the cerebellum and priapismus go together.—(*Burdach : Bau und Leben des Gehirns*, vol. iii., p. 422.)

Gustav Spies.—Margaret L., 36 years of age, married, mother of three children, was most irascible. Her husband noticed an abnormally excitable libido sexualis. Otherwise she was well, an affectionate mother, and an industrious housewife. An accident to her head increased her irascibility, and she had to be admitted to an asylum for violent mania.

Post-mortem.—Besides hæmorrhage into both middle fossæ, there was hyperæmia of the grey substance of the cerebellum.—(*Zur Casuistik der traumatischen Manie*, Würzburg, 1869.)

M. Huss gives a case of a joiner, named Engström, 46 years of age, who had the usual symptoms of cerebellar lesion, besides loss of libido sexualis, and in whom hæmorrhage, size of a walnut, was found in the cerebellum. The lesion was examined by Professor A. Retzius.—(*Report of the Seraphim Lazaret*, Stockholm, 1842.)

Giuseppe Seppilli.—Symmetrical atrophy of both hemispheres of the cerebellum of a young woman, M. A., single, aged 32, who did not menstruate until she was 20 years of age, and ever afterwards the menses were irregular, trivial in quantity, and sometimes quite suspended.—(*Rivista Sperimentale di Freniatria*, 1879.)

Dr. Amaldi.—Found in a woman, aged 47, who had died of cancer of the uterus, atrophy of the left hemisphere of the cerebellum.—(*Ibidem*, vol. xxi.)

E. Rossi.—A dumb idiot, 30 years of age, with paresis and ataxia of lower extremities, and very pronounced libido sexualis, died of pneumonia.

Post-mortem.—The cerebrum was normal. The cerebellum showed extensive atrophy of both hemispheres. The cells of Purkinje were almost completely destroyed.—(*Il Manicomio*, 1891, vol. vi., p. 297.)

Angelo Verdelli.—Boy, 19 years of age, subject to epileptic convulsions. *Les parties génitales étaient seulement d'une dimension d'un enfant de trois ans*, and the hemispheres of the cerebellum were only the size of a walnut. The vermiform process was larger than the hemispheres, and had well-marked fissures.—(*Rivista Clinica*, 1874.)

Ph. Lussanna observed thirty-five cases of disease of cerebellum with sexual symptoms.—(*Fisiologia e Patologia del Cervelletto*, Verona, 1885.)

Professor Carpenter stated that he had been made acquainted with "at least six cases (four were observed by Dr. Simpson of York) in which an extraordinary salacity developed itself at an advanced period of life ; whilst, concurrently with this, as following upon it, there was that kind of unsteadiness of gait which may be held to indicate chronic disease of

the cerebellum."—(Carpenter's *Human Physiology*, by Henry Power, London, 1881.)

Dr. Evanson.—A case of a young officer who, on the eve of marriage, having received a blow on the occiput by a fall from his horse, became impotent, without any other disorder of his bodily or mental powers, and in the distress consequent upon this discovery committed suicide on the morning fixed for the wedding.—(*Ibidem.*)

From a painting in the Borgia Room of the Vatican.

POPE ALEXANDER VI. BORGIA.

Who is recorded to have led a **voluptuous** life. Notice the want of height in the region of the *altruistic* sentiments compared to Cardinal Manning, and the large *posterior* development in the region of the *cerebellum*.

CHAPTER VIII

I.—THE RELATIONS BETWEEN BRAIN AND SKULL

The views of leading anatomists.

II.—THE SIGNIFICANCE OF CRANIAL CONTOURS

The views of Maudsley, Hack Tuke, Walshe, Davies, Cuvier, Graves, Carpenter, and others.

III.—THE BRAIN AND SKULL OF A TYPICAL CRIMINAL

The views of criminal anthropologists in harmony with Gall's observations.

IV.—THE DOCTRINE OF FREE-WILL

The author's explanation.
The views of Herbert Spencer, Auguste Comte, Gairdner, Tyndall, etc.

CHAPTER VIII

1. THE RELATIONS BETWEEN BRAIN AND SKULL

IS it possible to ascertain the relative size of the different convolutions during life by observing the different forms of the skull to which the brain gives its shape? Does the shape of the skull harmonise with the conformation of the brain? Certainly it does. The best modern authorities have now established as much as was ever claimed by Gall. I do not know of a single anatomist who denies that it is the brain which gives the form to the skull.

The want of entire and absolute parallelism between the two tables of the skull has sometimes been interposed as an insuperable objection to this mode of estimating the size of the brain; but even admitting that it does sometimes occur, when we know that the whole thickness of the skull seldom exceeds from one to three lines ($\frac{1}{5}$ in. according to Treves), whereas the differences in the development of the brain extend to inches, this objection falls to the ground. If we describe a head as being high, wide, or long, it is the brain that is developed in those directions, and it matters little whether the enveloping cranium is a line or two thicker at some points or not.

Skulls vary in thickness, but since nature, in forming

the bony frame of healthy people, has a uniform mode of working, a healthy man may be judged to have a thick skull if the other bones of the body are also strong and thick. On the other hand, we may infer from thin bones of the limbs a comparative thinness of skull under normal conditions.

It is curious that persons who have denied the parallelism between brain and skull, having their mind obscured by their antagonism against Gall, have been able to see "the left temple depressed in congenital aphasia."

The bones of the head, like all the other bones of the body, are alive, and their life is animal life; they are permeated by blood-vessels and absorbents; their materials are continuously in the course of removal and redisposition.

Every child is born with a tendency to that form of head which it afterwards assumes. To allow of this, the brain of the fœtus is not surrounded by any osseous substance, but by a transparent cartilaginous membrane. Centres of ossification form about the eighth week.

The skull is developed in membrane, and becomes osseous simply for protection of the brain. Could any person go the length of imagining that the size and shape of the body are determined by the state of the skin which surrounds and protects it?

Observe children's heads at different ages. The cerebral cavity, and consequently the whole contour of the head, enlarges in the same proportion as the brain increases in size, and this simultaneous enlargement continues so long as the head goes on growing.

Even at a very early age the convolutions are found impressed on the interior table of the cranium.

Manouvrier pointed out that the impressions of the convolutions on the inner surface of the skull are unshakable proofs: firstly, that the brain fits close to the skull; and secondly, that its position does not change, but it lies immovable.—(Société d'Anthropologie de Paris; Meeting of 4th November, 1885.)

There is no real hindrance to the estimation of the different parts of the brain in living individuals, as must be admitted by everyone who compares the illustrations in this book. The objection which has been raised by anti-phrenologists presents in point of absurdity almost an exact parallelism with avowing a disbelief in astronomy, on account of the aberration of sight or the unavoidable errors in optical instruments.

Some "objectors" to phrenology assume a patronising tone, and supply the poor phrenologist with elementary information concerning these cranial and integumentary irregularities; some adopt a tone of dignified censure, and others vituperate or sneer, but all assume that the phrenologist has never studied the relations of the brain to the skull. These benevolent gentlemen will be shown that they have themselves neglected to study anatomical text-books.

On this subject nothing more decisive could be quoted than Sir G. M. Humphry's *Treatise on the Human Skeleton:* "The skull is moulded upon the brain, and grows in accordance with it. The size and general shape of the brain may be estimated with tolerable accuracy by the size and general shape of the skull. *The opponents of phrenology, by denying this, do not in the least advantage their cause in the estimation of thinking persons, because the statement is of a kind at once to commend itself to common sense as being highly probable.* The frontal sinuses and the projecting ridges,

the inequalities on the surface of the skull, which have no correspondences in the interior, do not amount to much, and show only that allowance must be made, and that we must not expect in this way to form an accurate estimate; but they do not affect the principle that the skull is moulded upon and fitted to the brain, and that its exterior does, as a general rule, convey pretty accurate information respecting the size and shape of that organ. *The arguments against phrenology must be of a deeper kind than this to convince anyone who has carefully considered the subject.*"

Sir Wm. Flower in his lectures at the College of Surgeons in 1879, said that "*The skull is a fair index of the development of the brain in its different regions,* and ought therefore to be studied"; adding "that the longer he lived he saw fresh beauty and meaning in every line and configuration of the cranium, and that the fact that he could recognise particular skulls when presented to him as belonging to certain nations is a proof of there being certain fixed and uniform laws in regard to them."

Professor Moriz Benedikt says: "The best insight into the psychological nature of man is obtained by two methods. The first investigates the historical development of mankind. The second method is biological, in so far as it teaches us to recognise the structure and functions of the brain—the outer and exact cast of which is the skull. . . . We must recognise that a special part of the brain belongs to every special part of the skull, and therefore we must acknowledge that any deficient evolution of a special part of the skull corresponds to a deficiency of a special part of the brain, and consequently there must be a deficiency in the function of the latter. . . . It has been objected that

there are in the skull very many accidental secondary prominences which have no counterpart in the brain. Fairly considered, however, this objection is not very material, inasmuch as it refers only to unimportant and changeable details and comparatively rare abnormities. No scientific man, even if he does not altogether agree with Gall, disputes the doctrine that the construction of the skull is remarkably proportionate to the whole anthropological organisation in brutes and in man ; and the whole of craniology, as it is understood by anatomists and anthropologists, would have no meaning if this idea were not the leading one."

Professor Alexander Macalister.—"The largest part of the skull is that which is at once the receptacle and the protector of the brain, a part which, when unmodified by external pressure, premature synostosis, or other adventitious conditions, owes its form to that of the cerebral hemispheres which it contains. *Speaking in this city of George and Andrew Combe, I need not do more than indicate in this matter that observations and experiments have established on a firm basis certain fundamental points regarding the growth of the brain.* The study of its development shows that the convolutioning of the cerebral hemisphere is primarily due to the connection and different rate of growth of the superficial layer of cells with the underlying layers of white nerve fibres; and that so far from the shape being seriously modified by the constraining influence of the surrounding embryonic skull, the form of the soft membranous brain-case is previously moulded upon the brain within it, whose shape it may however be, to some extent, a secondary agent in modifying in later growth. We have also learned that the cerebrum is not a single organ acting as a functional unit, but consists of parts,

each of which has its specific province; that the increase in the number of cells in any area is correlated with an increase in the size and the complexity of pattern of the convolutions of that area; and that this in turn influences the shape of the inclosing shell of membrane and subsequently of bone.—(Meeting of British Association, Edinburgh, 1892.)

J. Ranke, in an address "On the Relations of Brain and Skull," stated that the differences in the form of the skull are entirely due to the differences in the development of the brain.—(German Anthropological Congress, Danzig, 1891.)

Rudolf Virchow and F. Obernier.—"All processes which augment the brain-substance have also an influence on the development of the skull."—(*Allg. Zeitschrift für Psychiatrie*, 1865, vol. xxii., p. 60.)

Cyclopædia of Anatomy and Physiology.—"A comparison of the external and internal surfaces of the cranium establishes the fact that there is a general correspondence of the two as far as regards those parts which are in contact with the periphery of the brain."

Galen (*De Usu Partium*, vol. viii.) long since said that the cranium is moulded on the brain, and not the brain on the cranium. De Laurens (*Hist. Anat.*, p. 139) and Diemerbroek (*Anat. Corp. Human*, p. 534) taught the same thing in the seventeenth century. In 1743 Fischer wrote a particular treatise making the same observation, and Blumenbach was equally convinced of it.

Baron Cuvier stated: "The brain moulds itself in the cavity of the skull, which it *fills exactly* in such a manner that knowledge of the bony part gives us information at least of the form of the exterior of the brain."

Magendie said: "The only way of estimating the volume of the brain in a living person is to measure the dimensions of the skull."

Sir Charles Bell.—"The bones of the head are moulded to the brain, and the peculiar shape of the bones of the head are determined by the original peculiarity in the shape of the brain."

Gratiolet, one of the greatest anatomists of the last century, very accurately observed that the cranium surrounding the brain has the shape of that organ truly engraved, otherwise the original form would be lost when the brain is taken out, as it is only a soft mass, and collapses when the blood ceases to circulate in it. Fortunately this form, though lost in the brain, exists in the shape of the cranium.

Samuel George Morton, author of *Types of Mankind* and *Crania Americana*, wrote: "The growth of the brain is consentaneous with that of the skull."

Dr. Frederick Petersen.—"It might be affirmed that every segment of the skull represents some particular part of the brain lying beneath it. This may be assumed without proclaiming oneself a proselyte of Gall."

George M. Robertson.—"It is commonly stated that the brain may be considered to be suspended in fluid, but this is a very erroneous view, for the brain with its pia-arachnoid covering is in a serous cavity—the subdural space—in which normally little or no fluid exists."

F. Treves.—"The amount of fluid in the subdural space is only enough to prevent friction during the movements of the brain. The fluid which is in the subarachnoid space *over the convexity of the brain* is insignificant."

GALL himself was the first to point out the irregularities of the skull in his article on the "Cranium" in the *Dictionary of Medical Science.* It is presumption, therefore, on the part of antiphrenologists to write as if the founders of phrenology had been ignorant of elementary anatomy.

GALL wrote: "The circumstance that the two tables of the cranium are not parallel in their whole circumference, and at all periods of life, would certainly be of the greatest importance if I had ever pretended to judge of all the minute shades of difference that exist in the convolutions of the brain. On the contrary, I have endeavoured to acquaint my hearers and readers with all the circumstances in question. I have spoken of the frontal sinus, of the separation of the two tables in the cranium in men and in animals. I wrote upon it in my article 'Cranium' in the *Dictionary of Medical Science.* I was the first to mention that it was impossible for us to determine with exactness the development of certain convolutions by the inspection of the external surface of the cranium. I was the first to treat in detail the variations in the thickness of the cranium which happen in old age, in insanity, etc. I was the first to teach that in certain cases the external table of the cranium is not parallel to the internal one. I have called the attention of anatomists to all these circumstances. Is it fair, then, of these anatomists to turn these facts into weapons against craniology? Why had they not the frankness to state by what means I have removed many of these difficulties, and to confess that I pursued my researches with candour, and considered it, in all its aspects, with impartiality?

"It is true that, after the cranium is removed, the prominence of certain cerebral parts do not appear such

as they are impressed on the cranium. But does it astonish anyone that the brain should sink and flatten down in some measure when the osseous box, which covers it and sustains and supports it on all sides, is removed?

"A critic who, in order to combat his adversary, is obliged to attribute to him opinions contrary to those which he professes, betrays the weakness of his own arguments. . . . By what right do these anatomists suggest the idea that men, who for a long series of years have devoted themselves to the study of the functions of the brain with an indefatigable zeal and a love of truth, overcoming all obstacles, have neglected to observe so necessary a condition?"

Gall points out that he only studied extremes of characters and, correspondingly, extremes of heads, and that in such cases, provided they are in a state of health and before old age has set in, the want of parallelism in the two tables of the cranium is not an obstacle to the observation of the brain beneath, which, wherever possible, he examined after the death.

He gives numerous engravings to convince the readers of his work, and deals with the details of the subject, such as the changes in the cranium at the decline of life, in a state of disease, etc.

However, the best proof of all that there really does exist a uniform correspondence between certain forms of head, skull, or brain, and certain characters of mind, as can be distinctly recognised by observation, is found in the numerous confirmations which the localisations made by Gall have received by clinical evidence in recent times: *vide* the localisation of fear, irascibility, music, etc.

CHAPTER VIII—*continued*

2. THE SIGNIFICANCE OF CRANIAL CONTOURS

WHAT Dr. Henry Maudsley, F.R.C.P., late Professor of Medical Jurisprudence in University College, London, thinks of practical phrenology:

"All broad-headed people," he writes, that he has found, "are very selfish, that is to say, all who have the head broad in proportion to its length"; and he accepts the observation of the phrenologists, "that an undue proponderance of the breadth of head throughout the region in which they place the propensities, indicates with certainty an animal self-love, which can scarcely be trusted at all times to adopt only fair means for its gratification. Undue preponderance, be it observed, for it is justifiable to expect a favourable result, even with a rather broad head which has a proportionately good length, and which has, so to say, the power of its length placed in the anterior half thereof. And why? Simply because there is in the front the greatest natural power, the force of intellect, which by exercise and development is able to control the objectionable propensities indicated in the animal broadness of skull."

To the question, What constitutes a noble head? Dr. Maudsley replies: "From the forehead the passage backwards above should be through a lofty

vault, a genuine dome, with no disturbing depressions or vile irregularities to mar its beauty; there should be no marked projections on the human skull formed after the noblest type, but rather a general evenness of contour."

On the question, What is a brutal head? Dr. Maudsley remarks: "The bad features of a badly formed head would include a narrowness and lowness of the forehead, a flatness of the upper part of the head, a bulging of the sides towards the base, and a great development of the lower and posterior part; with those grievous characters might be associated a wideness of the zygomatic arch, as in the carnivorous animal, and massive jaws. A man so formed might be expected, with some confidence, to be given over hopelessly to his brutal instincts."

Is a man, then, hopelessly chained down by the weight of his inheritance?

"By no means," is the answer of Dr. Maudsley, "for there is something else besides inheritance which makes fate, and that is education. It is a physiological law that the brain, throughout infancy, childhood, and youth, *grows* to the circumstances which it is placed among; and therefore the actual development of a brain may be much influenced by the sort of nutriment supplied to it as long as it grows. It would be rash, indeed, to venture to limit the effect which a right, reasonable, moral, physical, and intellectual education may have on the worst inheritance. But given an individual at the meridian of life, with a bad inheritance and a bad education, the benevolent enthusiast may hope for his reformation, and, all honour to him, labour for it; but the careful observer will be prone to smile at his expectations, and, regarding them

as a devout imagination, to compare them to those made to wash a blackamoor white."

Dr. Daniel Hack Tuke wrote: "The diversity as regards the form and size of the human cranium can only have escaped the notice of the least observant, or failed to excite some interest in the least reflective. This diversity is observable not only in regard to the whole head, but also to its several regions. The head of one is large and massive, of another small and ill-developed; but more than this, the forehead of one may be broad and ample, while that of another is shallow and retreating; these facts are notorious. On the other hand, the mental characteristics of one individual do not contrast less strongly with those of another. Between the two extremes of the highest psychical endowments and the helpless condition of idiocy, every conceivable shade of intellectual character or function is to be met with."

Dr. Walter Hayle Walshe wrote: "Prominent brows are to be found chiefly in persons of a practical turn of mind—men of great observation, great collectors of facts; the anterior portion of the frontal convolutions being largely developed, they cause the brow to jut out and overshadow the orbit."

Is it an *idle freak of nature* that the heads of the various nationalities differ, that the heads of various races differ, and that amongst the same race one man has a round head, another a cylindrical, another a sugarloaf head?

Barnard Davies, whose craniological researches have rendered such immense service to anthropological science, says that the cranium is subject to variations of size and of form, almost endless in the different races of man, and that these diversities are coincident

with and allied to disparity of powers, capacities, and character, which may be considered to a certain extent commensurate with the differences of conformation themselves.

Cuvier wrote: "Certain parts of the brain in all classes of animals are large or small according to certain qualities of the animals."

Professor Graves of Dublin.—"Accordingly we find that exactly in proportion as the encephalic portion of the nervous system is developed in the vertebrated animals, we can trace the appearance of new faculties, which, few and obscure in the lower species, become, as we ascend, more numerous and more distinct until we arrive at man, in whom the brain attains a degree of pre-eminence sufficient to place him far above all other species of mammalia. . . . Through the various degrees of instinct and intelligence observable in the different classes of the animal kingdom, we perceive an uninterrupted gradation, an unbroken chain, until we arrive at man, when the nervous system and the intellect receive a simultaneous improvement so great as to place man far above the rest of his fellow-creatures. But man does not only differ from other animals in the configuration of his brain and the capacity of his mind, but also exhibits the singular fact of a great difference, in these respects, between individuals of the same species; it being an obvious fact that different men exhibit as much disparity in their intellectual powers as if they were animals of a different genus. *In all such cases* (*where the difference between the intellectual powers is extreme*), *there also we invariably find a striking difference between the form and size of their skulls*, the most highly gifted always presenting a greater relative proportion of brain. So far, then,

must every reflecting man be a Phrenologist—so far must all concede that cerebral development and mental power are mutually proportioned to each other. But can we advance further than this general proposition, and may we not affirm that the anterior portion of the brain is proportioned in size to the intellectual faculties? Experiments on animals and observations on man afford very striking reasons for arriving at such a conclusion, which tends to establish the leading principle of the Phrenologist, 'that different portions of the brain perform different intellectual functions.' . . . It would appear, certainly, that the anterior portion of the brain is devoted to the intellectual faculties, but the strength of the moral feelings and animal propensities is regulated by the development of the remaining portions of the encephalic mass."—(*Lectures reported in London Medical Journal*, vol. ii.)

Professor Carpenter, who was not a phrenologist, said in one of his lectures: "When the brain is fully developed it offers innumerable diversities of form and size among various individuals, and there are as many diversities of character. It may be doubted if two individuals were ever exactly alike in this respect." —(*Medical Gazette*, September, 1841.)

CHAPTER VIII—*continued*

3. THE BRAIN AND SKULL OF A TYPICAL CRIMINAL

IN the preceding chapters it has been shown:

(1) That the pre-frontal lobe is concerned with the manifestation of the intellectual faculties;

(2) The temporal lobe with the propensities common to man and the lower animals;

(3) The parietal lobe and posterior part of the frontal lobe with certain emotions;

(4) The occipital lobe with the domestic and social affections.

If these localisations are correct, as one may well believe them to be, then the typical criminal should have well-developed temporal lobes (the animal propensities), deficient frontal lobes (intellect), and deficient occipital lobes (for he is rarely domestic or affectionate).

The typical criminal head rises little above the level of the point of ossification in the parietal and frontal bones (the altruistic sentiments are absent).

That this is actually the case is shown by the evidence accumulated by the School of Criminal Anthropology.

Professor Moriz Benedikt, who has examined and classified the collection of skulls and casts of heads of

criminals which Gall left behind at Vienna, found in the brains of criminals a reversion to the carnivorous type (breadth across the temporal areas). He also

JOSÉ SALVADOR FRANCH, WHO THREW THE BOMB IN THE LICEO THEATRE, BARCELONA, 1894.
A Sketch from Life.

found arrested development of the occipital lobes in the brains of murderers, the cerebellum being uncovered by them. He concludes that the occipital lobe is the seat of feelings.

The investigations of Hanot and Bouchard confirm these results.

Corre and Roussel have stated that the malformations in criminal heads consist chiefly in flattening of the frontal part and occiput.

A. Tamburini observed in murderers the temporal arches to be prominently developed, and close to the sagittal line.

P. Näcke found a small frontal lobe and a receding forehead common amongst habitual criminals, and he concludes that the small frontal lobe points to undeveloped intellectual powers, which is verified by the fact that so many of the congenital criminals are more or less imbecile.

The same author found only in one female criminal, out of twelve whom he examined, the occiput highly developed.

He also states that amongst 53 women prisoners, 41 suffered from increased irascibility, 33 were simply abusive, 24 were destructive, 23 violent and dangerous, and 12 given to impulsive fury. All of them were egotistical—the altruistic sentiment seemed totally absent.

W. Sommer has shown irascibility and delusions of persecution to be the most common form of insanity in criminals, a great many having hallucinations of hearing.

In the habitual criminal the passions predominate not merely from an excess of animal propensities, *but partly also from a defective condition of the inhibiting centres*, the higher intellectual and moral qualities. Hence the frequent outbursts of fury and destruction in prisoners.

David Nicolson (late Medical Superintendent Broadmoor Criminal Lunatic Asylum): "A high current of irascible emotion with its destructive tendency would in ordinary individuals be resisted, or at least moderated by their sympathies and conscientious feeling; *but such moderating influences occupy but a small*

space in the criminal nature, and consequently they afford a proportionately slight aid in resisting tides of passion. In the ill-cultured mind, reflection and volition do not step in quick enough to control the emotional activity. Without intellectual development, the emotions excited immediately expend their energy in outward manifestation.—(*Journal of Mental Science*, October, 1873.)

Dr. Daniel Hack Tuke said that he had examined the heads of criminals, and although he had not been able to reduce them to any general law, yet he did not doubt that such law did exist in the really criminal class. There was a difference between one hundred criminal heads and one hundred other heads. He cited an instance within his own experience to show what a striking resemblance sometimes prevailed between the heads of criminals.

The author has had the opportunity of examining in Vienna Professor Benedikt's collection of skulls and brains of criminals, and would like to remark, in connection therewith, that it is a great pity similar facilities for scientific research are not granted by the Home Secretary in England.

From Vimont's Atlas (reduced)

Martin.

A **parricide** of Paris, drawn after a cast.

Notice the development of the temporal region compared to the size of the entire head.

Contrast the frontal region with that of *Eustache*.

CHAPTER VIII—*continued*

4. THE DOCTRINE OF FREE-WILL

MANY psychologists speak of the will as if it were a separate entity. The will is not a separate entity. The will differs according to the character of the individual. The character is the sum total of the emotions or desires. The man wills according to the strength of his desires; as a rule he only wills after reflection, but in certain morbid states the object or idea which is presented to the mind may cause an immediate execution of the desire without the intervention of reflection, as for example in the homicidal impulse. Normally, much depends on education and training.

If there be more than one desire we deliberate. A man in whom the feeling of sympathy and benevolence is very strong may be moved to part with some money to a person who has the appearance of being in distress. Perhaps he himself at some period of his life went through some such experience. This would still further increase the impulse to relieve the suffering of his fellow-being. However, this memory of his own past sufferings may awaken simultaneously the fear of his again falling into trouble through the parting with his hard-earned money; he may also recollect that at the time he did not always receive the ready help which he

now wants to extend to the suffering stranger, and that only through his saving instinct he became what he is now; after much deliberation the saving instinct, stimulated by the emotion of fear, gets in the ascendant, and the silver coin is returned to the man's pocket.

The will, then, is not the *determining* agent, but is the result *determined* by the impulses.

The more cultivated the mind, and the more varied the experience, the better developed is the will and the stronger its co-ordinating power over the thoughts and feelings.

The strong or well-formed character which a well-fashioned will implies, is the result of a good training applied to a well-constituted nature; and the character is not directly determined by the will, but in any particular act it directly determines the will.

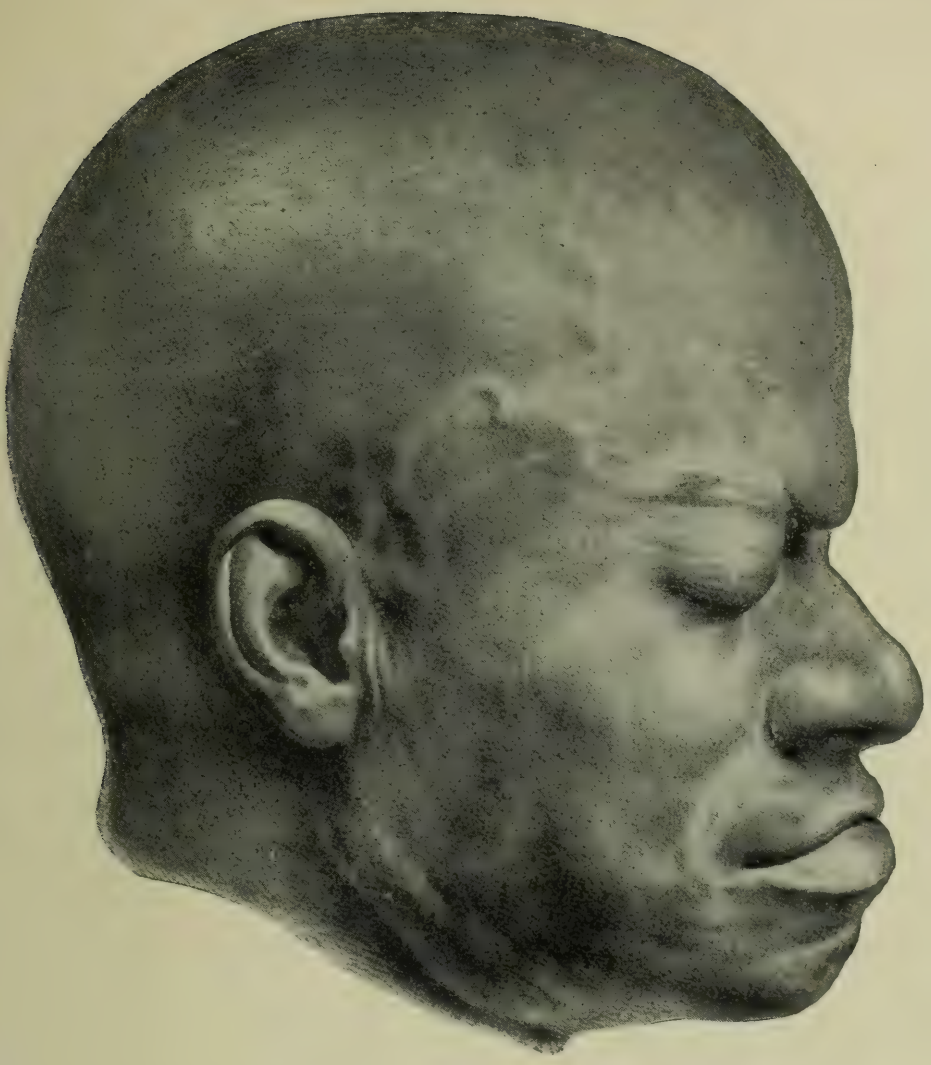
Those who believe in absolute free-will should reflect that the mere fact of a person having a character means that his tendencies are so uniformly the same that he can be trusted under similar conditions to act always the same way. We base our acts in reference to others on such assumption.

We can only will with such mental mechanism as is given to us.

The greater the variety of motives in a man, the greater is his moral liberty. The less a man is educated and the lower the organisation, the fewer compelling motives will he have.

"Every savage who speaks of his acts as a result of his own free-will, would probably feel hurt if he knew that he could not be distinguished from his fellows, and that we were quite content to include him in the race."—(Sir Samuel Wilks.)

Man brings into the world with him not a criminal



From Vimont's Atlas (reduced).

EUSTACHE

Alias Belin, a negro born at St. Domingo, who obtained "the prize of virtue" of the French Institute (1832).

"During an insurrection of the blacks in St. Domingo, and the massacre by them of the whites, Eustache, while in the capacity of a slave, saved, by his courage and devotion, the lives of his master and of 400 other whites at the risk of his own life. His 'benevolence' knew no limit."

Notice the large anterior and superior development of the head, and compare it with that of *Martin*.

brain, but such as may, through neglect and abuse, become so. Man has no mental centres in the brain naturally and essentially of evil tendency, but he has such as may lead to evils if not disciplined and held under due control; and whether he will thus train and govern them is a matter of choice resting with him. He has received from nature the capacity to do so, and if he neglect to avail himself of it, the fault and misfortune are both his own. In a word, all men not defective in constitution receive from nature the same mental centres, differing only in strength, and instead of being any of them evil in the abstract, they are all in themselves necessary and useful, qualifying our race for the station it occupies; and if the exercise of them be productive of evil, the cause will be found either in its excess or its misuse, both of which may be easily prevented.

Men are seduced into vice by their animal propensities, and withheld from it by their moral and reflective faculties. Let the latter, then, be so strengthened by education as to predominate over the former, and a life of morality and virtue will be the outcome.

Doubtless, proportionately to the development of the brain, so is the character of the individual, so are the capacities of the mind, and so are the impelling motives and inclinations. It is also true that the abnormal size of an organ indicates an excessive indulgence in the manifestation of the corresponding faculty. The evil actions which result are the effects of disobedience to natural laws. If a man loses control over his faculties in consequence of having imbibed too freely, one would not term that "fatalism."

Daily experience teaches that some men are inclined to be virtuous, while others are inclined to be vicious.

The physiologist only affirms and proves that such tendencies are regulated by the organisation. Phrenologists do no more than other scientific men; they study the laws of nature, they do not alter nature. Unless their observations accord with actual facts, and are verified by experience, they are worth nothing. Galileo's discovery that the earth goes round the sun did not alter the world; and though his contemporaries made him suffer for holding such opinion, the earth went round the sun all the same; it always has done so, it is doing so now, despite the contemporaries of Galileo. If the physiologist is able to indicate the disposition of a person he does not thereby take away his liberty of action; he is only telling him how much his action is influenced; what is the proportion of force exerted on him by his intellectual faculties, his emotions, and animal propensities. Such proportion differs in each man, still it does vary according to certain laws, and only within certain limits. These laws were at work before the discovery of the functions of the brain, they are at work this very moment, and will continue to be so, irrespective of individual opinion as regards them. The putting of phrenological works "on the Index" may take place as was the case in 1837; so-called learned men may treat the upholders of phrenology with contempt; but if the doctrine be true, scientific research must ultimately prove it to be so, whatever prejudice or misapprehension may in the present day say against it.

Sir Frederick Bateman.—"Gall's labours would undoubtedly have met with more hearty recognition from his contemporaries, had not the Austrian priesthood raised the cry of 'materialism' as applied to his doctrines. The great German psychologist had no

such heterodox notions as his adversaries maliciously attributed to him, for, as Hufeland philosophically observes, 'He was employed in analysing the dust of the earth of which man is formed, not the breath of life which was breathed into his nostrils.'

"As in Gall's days so in ours, this very indefinite and unmeaning word 'materialism' is used as a kind of psychological scarecrow to frighten all those who are endeavouring to trace the connection between matter and mind. Surely there is nothing contrary to sound theology in assigning certain attributes or functions of an intellectual order to certain parts of our nervous centre; the cerebral localisation of our divers faculties, and the plurality of our cerebral organs, strikes no blow at the great principle of the moral unity of man. The same power that caused the earth, like a spark from the incandescent mass of unformed matter, hammered from the anvil of omnipotence, to be smitten off into space, this same power, surely, could just as well ordain that a multiplicity of organs should be necessary to the full development of man's mental faculties, as that the manifestation of them should depend on the integrity of one single organ."

Herbert Spencer says: "That everyone is at liberty to do what he desires to do (supposing there are no external hindrances), all admit; though people of confused ideas commonly suppose this to be the thing denied. But that everyone is at liberty to desire or not to desire, which is the real proposition involved in the dogma of free-will, is negatived as much by the analysis of consciousness, as by the contents of the preceding chapters. From the universal law that, other things equal, the cohesion of psychical states is proportionate to the frequency with which

they have followed one another in experience, it is an inevitable corollary that all actions whatever must be determined by those psychical connections which experience has generated either in the life of the individual or in that general antecedent life of which the accumulated results are organised in his constitution.

"When after a certain composite mass of emotion and thought has arisen in him, a man performs an action, he commonly asserts that *he* determined to perform the action; and by speaking as though there were a mental self, *present to his consciousness*, yet not included in this composite mass of emotion and thought, he is led into the error of supposing that it was not this composite mass of emotion and thought which determined the action. But while it is true that he determined the action, it is also true that the aggregate of his feelings and ideas determined it; since, during its existence, this aggregate constituted his entire consciousness—that is, constituted his mental self.

"Naturally enough, then, the subject of such psychical changes says that he wills the action; since, psychically considered, he is at that moment nothing more than the composite state of consciousness by which the action is excited. But to say that the performance of the action is, therefore, the result of his free-will, is to say that he determines the cohesions of the psychical states which arouse the action; and as these psychical states constitute himself at that moment, this is to say that these psychical states determine their own cohesions, which is absurd. Their cohesions have been determined by experiences—the greater part of them constituting what we call his natural character, by the experience of antecedent or-

ganisms; and the rest by his own experiences. The changes which at each moment take place in his consciousness, and among others those which he is said to will, are produced by this infinitude of previous experiences registered in his nervous structure, co-operating with the immediate impressions on his senses; the efforts of these combined factors being in every case qualified by the physical state, general or local, of his organism.

"The irregularity and apparent freedom are inevitable results of the complexity. The same holds good in the organic world. A body attracted by a single other body, its course in space can be accurately predicted. A body attracted by two other bodies, its course can be less accurately predicted. A body attracted by three other bodies, still less accurately. A body attracted by multitudinous bodies of all sizes and distances, as in a star-cluster, its motion will *appear* free. Similarly in proportion as the cohesions of each psychical state to others become great in number and various in degree, the psychical changes will become incalculable and apparently subject to no law.

"We speak of will as something apart from the feeling or feelings which for the moment prevail over others; whereas it is nothing but the general name given to the special feeling that gains supremacy and determines action. Take away all sensations and emotions, and there remains no will. Excite some of these, and will, becoming possible, becomes actual only when one of them, or a group of them, gains predominance. Until there is a *motive* (mark the word) there is no will."

Auguste Comte.—"Among the innumerable objec-

tions which have been aimed at this fine doctrine [phrenology],—considered always as a whole,—the only one which merits discussion here is the supposed necessity of human actions. This objection is not only of high importance in itself, but it casts new light back upon the spirit of the theory, and we must briefly examine it from the point of view of positive philosophy.

"When objectors confound the subjection of events to invariable laws with their necessary exemption from modification, they lose sight of the fact that phenomena become susceptible of modification in proportion to their complexity. The only irresistible action that we know is that of weight, which takes place under the most general and simple of all natural laws. But the phenomena of life and acts of the mind are so highly complex as to admit of modification beyond all estimate; and in the intermediate regions phenomena are under control precisely in the order of their complexity.

"Gall and Spurzheim have shown how human action depends on the combined operation of several faculties; how exercise develops them; how inactivity wastes them; and how the intellectual faculties, adapted to modify the general conduct of the animal according to the variable exigencies of his situation, may overrule the practical influence of all his other faculties. It is only in mania, when disease interferes with the natural action of the faculties, that fatality, or what is popularly called irresponsibility, exists. It is therefore a great mistake to accuse cerebral physiology of disowning the influence of education or legislation, because it fixes the limit of their power. It denies the possibility, asserted by the ideology of the French school, of converting by suitable arrange-

ments all men into so many Socrates, Homers, or Archimedes, and it denies the ungovernable energy of the I, asserted by the German school, but it does not therefore affect Man's reasonable liberty, or interfere with his improvement by the aid of a wise education. It is evident indeed that improvement by education supposes the existence of requisite predispositions, and that each of them is subject to determinate laws, without which they could not be systematically influenced; so that it is, after all, cerebral physiology that is in possession of the philosophical problem of education."

Sir W. T. Gairdner.—"It is in strict accordance with all we know of the hereditary transmission of the physical instincts, along with that of the structures conformed to them, *that such changes, even when thus acquired, may become hereditary;* so that vicious habits and unsound propensities, in the first instance implanted by accident or by training, may, *when confirmed by habit into instincts,* be transmitted so as to vitiate a whole race, just as *tricks* of manner often pass from parent to offspring under circumstances wholly precluding the possibility of direct imitation."

"I cannot conceive of a mind, which for any length of time, or even from any temporary cause, has become the slave of any bad passion, or vicious indulgence, or, indeed, that is subject to any kind of abnormal manifestation whatever, as being associated with a brain that is utterly and absolutely normal: because I think the very fact of an abnormal manifestation disturbs the normal physical constitution of the organ."—(*Journal of Mental Science*, July, 1873.)

Professor John Tyndall.—"What is meant by free-will? Does it imply the power of producing events without antecedents? of starting, as it were, upon a

creative tour of occurrences without any impulse from within or from without? Let us consider the point. If there be absolutely or relatively no reason why a tree should fall, it will not fall; and if there be absolutely or relatively no reason why a man should act, he will not act. It is true that the united voice of this assembly could not persuade me that I have not, at this moment, the power to lift my arm if I wish to do so. Within this range the conscious freedom of my will cannot be questioned. But what about the origin of the wish? Are we or are we not, complete masters of the circumstances which create our wishes, motives, and tendencies and action? Adequate reflection will, I think, prove that we are not. What, for example, have I had to do with the generation and development of that which some will consider my total being, the living and speaking organism which now addresses you? As stated at the beginning of this discourse, my physical and intellectual textures were woven *for* me, not *by* me. Processes in the conduct or regulation of which I had no share have made me what I am. There surely, if anywhere, we are as clay in the hands of the potter. It is the greatest of delusions to suppose that we come into this world as sheets of white paper on which the age can write anything it likes, making us good or bad, noble or mean, as the age pleases. The age can stunt, promote, or pervert pre-existing capacities, but it cannot create them."—(*Fortnightly Review*, 1st November, 1877.)

CHAPTER IX

THE HISTORY OF GALL'S DOCTRINE AND PHRENOLOGY

1. Gall's Biography.

   Gall one of the most eminent physicians in Vienna.

2. Gall's Discoveries of the Structure of the Brain and Spinal Cord.

   A list of Gall's anatomical discoveries, any one of which should have sufficed to bring him fame—Gall, the instructor of most European university professors—The knowledge of his contemporaries—Their testimonials as to the genuineness of Gall's discoveries—Gall's chief work never opened—The injustice of old and modern authors—Sir Samuel Wilks on Gall.

3. Gall's Discoveries of the Mental Functions of the Brain.
   Spurzheim's and Combe's Phrenology.

   The state of knowledge prior to Gall—Gall's discoveries of the physiology of the brain—Gall's protest against the premature introduction of the system entitled "Phrenology," founded by Spurzheim and Combe.

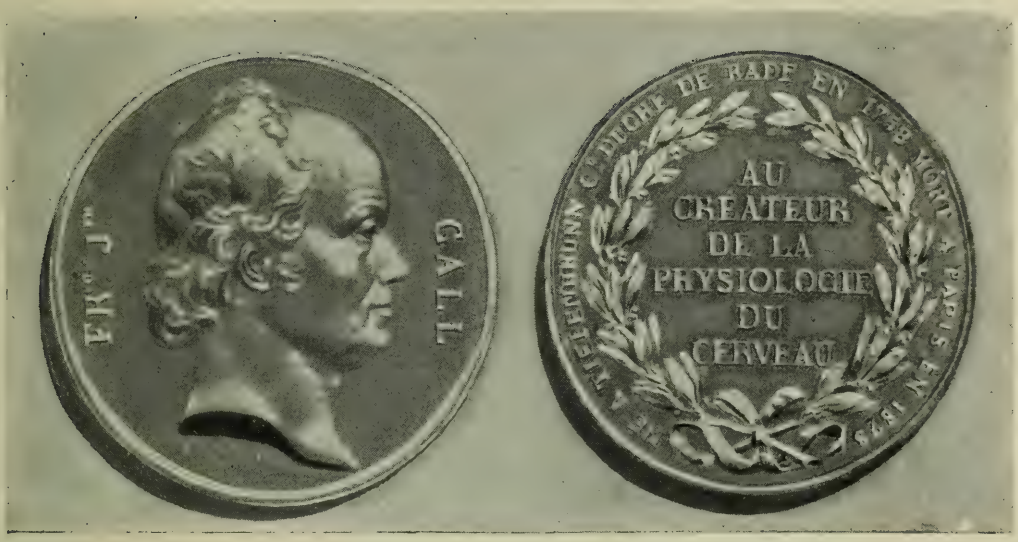
4. The State of Phrenology Fifty Years Ago.

   Names of the most eminent British and French disciples—The vastness of the phrenological collections of brains and skulls—University lectures on phrenology—H.M. Queen Victoria consulting George Combe as to the cerebral developments of her children, and directing their education according to his instructions—Testimonial from the Prince Consort.

5. The Disrepute of Phrenology brought about by Ignorant "Professionals."

   The "bump" theory—Gall's protest—Protest by the *Lancet*.

PLATE XXI.



FACSIMILE OF MEDAL.

In memory of Dr. Gall,
"The founder of the physiology of the brain."

CHAPTER IX

THE HISTORY OF GALL'S DOCTRINE AND PHRENOLOGY

1. Gall's Biography

GALL has been so often referred to in preceding chapters that a brief account of his history will now be perused with much interest.

Franz Joseph Gall was born at Tiefenbrunn near Pforzheim in Baden, on 9th March, 1758. He studied medicine at Strassburg. In 1781 he left this town for Vienna to study under Van Swieten, the most renowned physician of his time. In 1785 Gall received his doctor's degree.

Dr. Gall resided in Vienna upwards of thirty years, and was recognised as an able physician. He was the friend of Dr. Stoerk, physician to Maria Theresa, the Emperor Joseph, and also to Francis I. at the commencement of his reign. Dr. Stoerk recommended Dr. Gall as his successor, and the Emperor expressed his readiness to give effect to the recommendation. Dr. Gall, however, stated that he was not born for Court life, and that he disliked the restraints which it would impose upon him, hence he declined the intended honour; he recommended Dr. Stifft, who was accepted. This was in 1794 or 1795, a year or two before Gall announced his discoveries to the public. Dr. Stifft, in

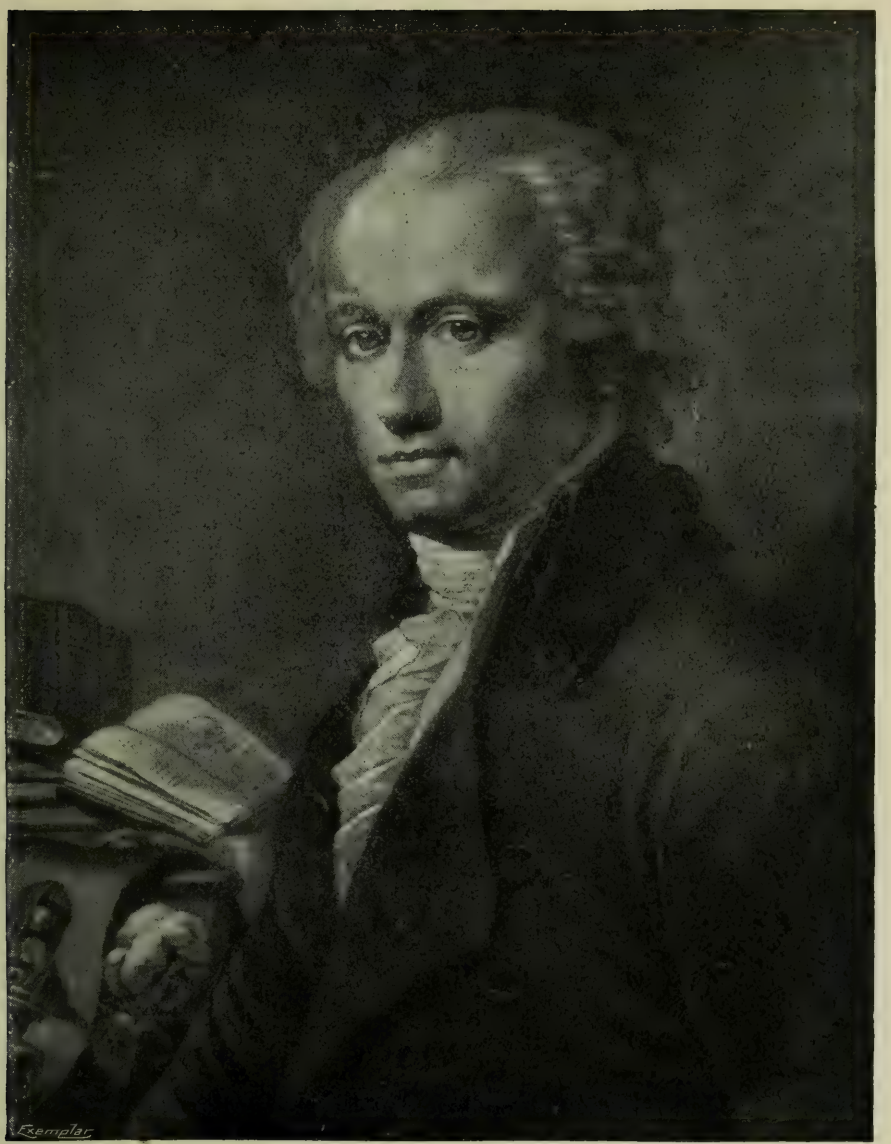
course of time, became physician to the Emperor, and president of the Faculty of Medicine, and, possibly dreading Gall, his benefactor, he advised the Emperor to prohibit his lectures, as being of dangerous tendency. So influential and dogmatic was Dr. Stifft that he was styled *Sa Majesté Médicinale.* The government, being influenced besides by the Roman Catholic clergy, interdicted Gall's lectures; in consequence thereof, Gall left Austria and went on a lecture tour through Germany, Holland, Switzerland, etc.

The Medical and Physical Journal, Edinburgh, vol. xv., March, 1806, contains an account of Gall's travels in Germany:

"The craniology of Dr. Gall was the favourite topic of the German literati during the summer of 1805, at almost every university and capital of the northern provinces of Germany.

"In the beginning of last spring the doctor set out for Berlin, and lodged in the house of his intimate friend, Mr. Kotzebue. He here met with universal acceptance. The king, the queen, princes, and princesses interested themselves so much in his discoveries that he obtained an invitation to go through a course of lectures in presence of the royal family, during which the queen inspected the dissection of a human brain, while the doctor demonstrated the whole series of his astonishing discoveries.

"A rancorous attack was now commenced against his theory by Dr. Walter, leading anatomist in Berlin, but it failed of the intended effect, every person being convinced that it was dictated by envy. On the opposite side, the justly renowned Dr. Hufeland, first physician to the king, almost all the faculty, as well as others, professed their full assent, and several interest-



DR. FRANCIS JOSEPH GALL.
Born 9th March, 1758, died 22nd August, 1828.

"The profound observer whose genius has opened for us the study of the anatomy and physiology of the Brain."—Flourens.

ing tracts were published, in which ample justice was done to the theory.

"Dr. Gall visited the houses of correction and prisons in Berlin and Spandau, and gave the most convincing proofs of his ability to discover, at first sight, such malefactors, thieves, and men of particular talents as were amongst the convicts and prisoners. At Torgau, where he also visited a house of correction, Professor Boettiger accompanied him, who afterwards published Gall's observations, an abstract of which is given in this article."

After long and successful travel, Gall settled in Paris in 1807, and lived there for about twenty years.

Prince Metternich, Ambassador to Napoleon, was a pupil of Dr. Gall, and it is supposed that the Prince's influence was brought to bear upon the Emperor Francis I., so that he invited Gall in 1814 to return to Vienna. Gall declined to do so, and assigned as his reason that he was now established in Paris, and would be forced to begin the world anew if he removed to Vienna.

The following shows Prince Metternich's belief in phrenology. He wrote to his wife:

"The sculptor Canova, who is not a disciple of Gall, proved to me, beyond the margin of a doubt, that the doctrine of Gall is true even to the smallest detail."

Geoffroy St. Hilaire induced Gall to apply for admission into the *Académie des Sciences.*

On the 14th March, 1808, he submitted his researches to the Institute of France. In the same year he commenced his work, *Anatomie et Physiologie du Système Nerveux en Général et du Cerveau en Particulier*, comprising four folio volumes and an atlas containing one hundred copper-plate engravings. The work was got

up regardless of expense and cost a fortune. Its publication took from the year 1808 to the year 1820.

In 1820 a gold medal was presented to Gall, executed by M. Barre. It bore the inscription : "To the Founder of the Physiology of the Brain."

Dr. Elliotson wrote : "Dr. Gall ranks high in Paris ; he is a physician to ten ambassadors, has a large practice, is considered a savant, and bears himself and lives becomingly, like a gentleman.

"Gall's head is magnificent ; and his countenance, dress, and manner, with the depth, continuousness, liberality, and simplicity of his remarks show you that you are in company with a profound philosopher, a perfect gentleman, and a most kind-hearted friend. He is perfectly free from affectation or quackery ; pursues truth only, regardless of all consequences, and has sought it at an immense expense, and free from all interested motives. . . .

"I advised him to write some popular work, but he objected ; said he had written for the studious only—for those who desired to understand the subject thoroughly ; that he had composed a work for posterity, and must leave to others the occupation of writing for loungers."

Another account, describing an interview in 1826 (*Birmingham Journal*, a letter dated 19th September, 1828), ends thus :

"After our breakfast he showed me his extensive collection, and thus ended my first visit to the greatest moral philosopher that Europe has produced ; to a man, than whom few were ever more ridiculed, and few ever pursued their beat more determinately, despite its effects ; to a man who alone effected more change in mental philosophy than perhaps any predecessor ; to a

man who suffered more persecution, and yet possessed more philanthropy than most philosophers."

Baron Cuvier, mindful of his position, would not openly advocate Gall's doctrine; but that he believed in it is shown by his sending Gall a cranium, "which," he said, "appeared to him to confirm his doctrine of the physiology of the brain." Gall was already on his death-bed, and told the messenger: "Take it back and tell Cuvier that my collection only wants one head more, my own, which will soon be placed there as complete proof of my doctrine."

Gall died of a paralytic stroke on the 22nd August, 1828, 71 years old, in his villa at Montrouge, near Paris, and was buried in the cemetery of Père-Lachaise, where a monument was erected in 1836. His cranium is in his own collection in the Natural History Museum of Paris.

2. Gall's Discoveries of the Structure of the Brain and Spinal Cord

1. Gall was the first to demonstrate the successive developments of the different parts of the nervous system. The Committee of the Institute of France, in their Report on Gall's discoveries, made the very grave error of raising the objection that "in the nervous system all is formed simultaneously."

2. He was the first to show the enlargements of the cord in the cervical and lumbar regions. Serres and Carus wrote against this discovery.

3. He was the first to demonstrate that the grey matter precedes the white. Rolando and Serres denied this vehemently. They believed the white matter preceded the grey.

4. He was the first to trace the origin of the nerve bundles from the grey matter. Serres wrote that the

white fibrous substance of the nervous system gives origin to the non-fibrous substance; that the nerves are formed from the circumference to the centre, and not from the centre to the circumference.—(*Comparative Anatomy of the Brain*, vol. i., Paris, 1824.)

5. Gall wrote on the structure and use of the ganglia. Respecting the use of the grey substance where it is implanted where white fibres become more numerous, Gall regarded it as the source and nourisher of the white fibres. TIEDEMANN wrote: "Gall is in error in affirming that the grey substance is the first formed, and produces and nourishes the nerves."

6. Gall showed the proportion between the grey and the white substance in the brain.

7. He showed the true origin of the optic nerve in the anterior pair of the corpora quadrigemina. All his contemporaries—ROLANDO, RUDOLPHI, TIEDEMANN, etc. —declared the optic thalamus to be the origin of the optic nerve.

8. He traced the origin of the olfactory nerve.

9. He traced the origin of the oculo-motorius nerve.

10. He traced the origin of the trigeminal nerve.

11. He traced the origin of the nervus abducens.

12. Gall was the first to describe the course of the motor nerves through the pyramids, cerebral peduncles, corpora striata, thence "radiating like a fan, thus spread out towards the periphery of the hemispheres." (See T. C. ROSENMÜLLER, Professor of Anatomy at Leipsic: "Account of Dr. Gall's Discoveries Regarding the Structure of the Brain," in the *Edinburgh Medical and Surgical Journal*, July, 1806.) SÖMMERING, in opposition to Gall's discovery of the course of motor and sensory nerve-fibres to the grey matter of the brain, declared that all motor and sensory nerve-fibres take

their origin in the walls of the ventricles, and that they are united by no other material than the cerebro-spinal fluid, which must be regarded as the seat of mind.

13. Gall established the certainty of the decussation of the pyramids, in opposition to Prochaska, Barthez, Sabatier, Royer, Dumas, Bichat, Chaussier, Magendie, Desmoulins, Haller, and Morgagni.

14. Gall showed the fibrous structure of the white matter of the brain. The *Edinburgh Review* denied it. This may appear truly ridiculous to modern anatomists, but it affords an insight as to the state of knowledge of cerebral anatomy obtaining in Gall's time.

15. Gall described the system of the diverging and converging fibres of the brain.

16. Gall was the first to describe the formation and development of the brain in the fœtus, and to call attention to the simplicity of the convolutions in new-born infants, and in idiots, as compared with the complexity of the brain of the normal adult. Dr. Paul Topinard (*Anthropology*, London, 1890) assigns the credit of this discovery to Desmoulins in 1825, when Gall's work had been before the public for some years; but then Topinard deems Gall's work an "imaginary fancy."

17. Gall described the structure of the cerebellum in man and animals. He also described for the first time the formation and structure of the great commissure (corpus callosum), the annular protuberance, the pineal gland, cornu ammonis, and other parts of the brain. (See Dr. D. Foissat, *Les localisations cérébrales*, Paris, 1881.) Fauville held that the great commissure was a continuation of the corpora striata.

18. Gall described the portion of brain within the fissure of Sylvius and resting on the corpus striatum,

which he described as the insula, and is now known as the Island of Reil. We must not forget that Reil attended the demonstrations of Gall.

I have confined myself to those discoveries by Gall which have been acknowledged at some time or other by independent writers; but anatomists will find in the volume on the anatomy of the brain in Gall's large work many more original observations, as is evident from Flechsig and Meynert's statements, and will be more competent to judge of their value than I dare claim to be.

Gall in his day was described as a swindler, impostor, charlatan, etc. Sir Charles Bell said of Gall that he did not know the difference between the brain and the cerebellum.

The *Edinburgh Review* (No. 49) wrote: "It appears to us that in the anatomical department Gall and Spurzheim have displayed more quackery than in any other, and their bad faith is here the more unpardonable that it was so much the more likely to escape detection. Such is the grand system of the diverging and converging fibres of the brain, of which Drs. Gall and Spurzheim are the sole inventors and proprietors. . . . It is our painful duty to remark that the system is a complete fiction from beginning to end. . . . We must ascribe their inaccuracies solely to intention. . . . The writings of Drs. Gall and Spurzheim have not added one fact to the stock of our knowledge respecting either the structure or the functions of the brain, but consist of such a mixture of gross errors, extravagant absurdities, downright misstatements, as can leave no doubt, we apprehend, in the minds of honest and intelligent men, as to the real ignorance, the real hypocrisy, and the real empiricism of the authors."

Such was the slander prevalent during Gall's lifetime, and such it is even to-day.

Not one modern anatomist or physiologist can have opened Gall's works, otherwise they would not echo the remarks of Sir Charles Bell and the *Edinburgh Review*. *Where is the text-book on anatomy or physiology which mentions even one of the numerous discoveries of Gall which I have cited?* But if they have never opened Gall's works, are they competent to pass judgment on his doctrine? What value have Charlton Bastian's or anybody else's criticisms of Gall's doctrine, seeing that they have never studied Gall's work?

Incensed at the enthusiastic reception which Gall received in Berlin, where a medal was struck to commemorate his visit, J. G. Walter, Professor of Anatomy at the University, cited the discoveries of Gall, and not only denied them but set to work to prove them as being all "imaginary."

Professor Walter of Berlin was the first scientist to abuse Gall.

The Edinburgh Medical and Surgical Journal, July, 1806, says: "Professor Walter is very bitter against the author. The wrath of the venerable anatomist is sometimes quite laughable. He surely might have refuted his antagonist without abusing the object of his lectures, and without referring to the fatal consequences of his opinions, supposing them to be true. Such reasoning avails nothing in physics or in metaphysics. The professor would have done better not to have run so often out of his museum to pick a quarrel with people in the street. The pages of both his pamphlets are filled with dull attempts at wit, partly copied from newspaper scribblers, and partly written for the occasion by Professor Walter himself. He declares that

Dr. Gall is completely ignorant of anatomy; that much was promised, and very little performed; that he saw no such parts as were pretended to be shown, and was not at all satisfied with the artificial wax preparations and sarcastic jokes which astonished the gaping multitudes."

Rudolphi, Professor of Physiology of the Royal Academy of Science, also contributed a great deal, in his time, to spread erroneous notions regarding the discoveries of Gall; and since man has a greater tendency to believe on the faith of another than to examine and judge for himself, Rudolphi must have been — like Leuret and Lelut in France — godfather to many antiphrenologists of later periods. Rudolphi did not approve of Gall bringing in the evidences of comparative anatomy in support of his theory, for beasts, he thought, should not be compared with man. According to him, it is only the mind of animals that requires different cerebral parts for the manifestation of different aptitudes and instincts. For man, the Creator would have been able, perhaps ought, to have constituted mind entirely independent of this vile inert matter. With these views, it is not surprising that Rudolphi wrote: "I have had occasion to examine many hundreds of brains, but I have never found anything which was in accordance with the theory of Gall." He states that he has not seen the enlargements of the spinal cord, the decussation of the pyramids, the structure of the cerebellum, of the annular protuberance, the formation of the corpus callosum, the origin of the optic nerve, etc.

Dr. W. Elford Leach wrote on the 31st January, 1815: "Certain anatomists in London and one in Edinburgh have absolutely denied the truth of Dr. Spurz-

heim's observations on the structure of the brain, and have pronounced them to be fanciful. These assertions have not been made by those who have seen him dissect the brain, but even by those, who from illiberality or idleness, are not inclined to investigate the subject, and therefore have ridiculed as false what they are too indolent to examine. After a minute investigation I do not hesitate to pronounce that what Dr. Spurzheim has asserted respecting the structure of the brain is perfectly correct, and that this structure may be seen by any anatomist who may be disposed patiently to examine that organ, after the mode directed by Dr. Spurzheim."

Gall gave demonstrations before all the anatomists and physiologists of Central Europe. Several of them appropriated his discoveries and gave them out as being their own. See Gall's work, in which he shows that these plagiarists had not always grasped his meaning, and thus gave such a faulty description as demonstrated at once that the discovery was not their own.

The present generation of brain-experts is not aware how much they are indebted to Gall, the founder of brain-science.

The same Dr. John Gordon, Professor of Anatomy in Edinburgh, who described the anatomical discoveries of Gall in the *Edinburgh Review* as "quackery from beginning to end," and as "amazing absurdity" in 1815, two years later—in 1817— endeavoured to prove, in a specially printed pamphlet, that Gall had borrowed his ideas from Reil, quite ignoring the fact that Reil attended Gall's demonstrations at Halle in 1805, and had certified: "I have seen in the anatomical demonstration made by Gall more than I thought that a man could discover in his whole lifetime." As Gall says: "Let anyone compare the early works of Reil with those he

has published since he has attended our dissections at Halle in 1805, and let them also compare the successive improvements in both the lectures and books of Richeraud, Beclard, Blainville, Serres, Georget, Lallemand, Tiedemann, Carus, etc., and they will be astonished at the progress which has been made since the appearance of my expositions. . . . The enthusiasm with which Reil and Loder have received my discoveries is well known."

Dr. Gordon relied on the book which Reil published in 1807, two years after Gall's visit, in which Reil makes no mention of Gall; at the same time he does not claim these discoveries for himself. Though Gall's *magnum opus* did not appear until 1810, and then only in parts, numerous booklets describing his discoveries had been published in Germany, some eight years previous, by medical men who had attended his lectures and demonstrations in Vienna and elsewhere. If Gall's work had not been original, the French Academy would have taken no notice of it, or would at least have made some mention of its lack of originality in their Report.

It is worthy of notice, too, that Dr. Gordon, though he possessed Gall's original work, preferred to criticise the anatomy of Gall as described in condensed form in a contribution to the *French Dictionary of Medicine*, "the large work being too tedious for general perusal." Dr. Gordon's attacks failed completely, for Spurzheim's subsequent lectures, demonstrations, and dissections converted many men, and his serenity of deportment, notwithstanding the cruelty of Dr. Gordon's criticism, who even tried to disturb the meetings, won for him many friends.

The remarks by Dr. Hufeland, Physician to the King of Prussia, are very different in their tone and

temper from those of his colleague, Professor Walter. They betray good sense and candid judgment. He says no one could be more prepossessed against Gall's doctrine than he was himself, before he became acquainted with the author; and only by attending the lectures and demonstrations, and being convinced from what he saw, did he become a partisan. Such a confession is justified by an appeal to facts, and is published from a desire of expressing the truth under whatever shape.

"It is only necessary to have eyes, and to open them, to be convinced of what Gall demonstrated concerning the dissection of the nerves, the crossing of the pyramids, etc. In order to see this structure, the brain must be dissected after Gall's method, following the parts from below upwards through all their ramifications." With regard to the discovery of there being two distinct sorts of nerves, one going to the circumference of the brain, and the other returning, and these two sets being always found together (nerves of sensation and motion), Hufeland expresses his want of faith. He continues: "It is with great pleasure and much interest that I have heard this estimable man himself expound his new doctrine. I am fully convinced that he ought to be regarded as one of the most remarkable phenomena of the eighteenth century, and that his doctrine should be considered as forming one of the boldest and most important steps in the study of the kingdom of nature. *One must see and hear him to learn to appreciate a man completely exempt from prejudice, from charlatanism, from deception, and from metaphysical reveries.* Gifted with a rare spirit of observation, with great penetration, and a sound judgment—identified, as it were, with nature—becoming her confidant from a constant intercourse with her—he has collected,

in the kingdom of organised beings, a multitude of signs and phenomena which nobody had remarked till now, or which had been only superficially observed. He has combined them in an ingenious manner, has discovered the relations which establish analogy between them, has learned their signification, has drawn consequences and established truths, which are so much the more valuable that, being based on experience, they emanate from nature herself. He ascribes his discoveries solely to the circumstance of his having given himself up ingenuously and without reserve to the study of nature—following her in all her gradations, from the simplest result of her productive power to the most perfect. *It is an error, therefore, to give this doctrine the name of a system*, and to judge of it as such. True naturalists are not men to form systems. Their observations would not be sufficiently accurate if they were prompted by a systematic theory, and realities would not square with the various limits of their notions. Hence, the doctrine of Gall is not, and cannot be, anything except a combination of instructive natural phenomena, of which a part consists at present only of fragments, and of which he makes known the immediate consequences."

Loder, one of the great anatomists of Dr. Gall's time, wrote: "Now that Gall has been at Halle, and I have had an opportunity, not only of listening to his lectures, but also of dissecting with him, either alone or *in the company of Reil*, and several others, nine human brains and fourteen of animals, I think I am able and entitled to pronounce my opinion of his doctrines. . . . *The discoveries in the brain made by Gall are of the highest importance.* Many of them possess such a degree of evidence that I cannot conceive how anyone with good eyes

can mistake them. I refer to the passage of the nerve fibres in the corpora pyramidalia, and thence into the crura, corpora striata, and hemispheres, the bundles of the spinal marrow, the origin of the motor nerves of the eyes, the trigeminal nerves, those of the sixth pair of nerves, etc. These discoveries alone would be sufficient to render the name of Gall immortal. They are the most important that have been made in anatomy since that of an absorbent system. . . . *I acknowledge with Reil* that I have found in Dr. Gall more than I believed it possible for a man to discover in a lifetime.

"The unfolding of the convolutions is a capital thing. What have we not the right to expect from further progress in a route thus opened? I am ashamed of myself for having, like others, for thirty years cut up some hundreds of brains, as we slice up cheese, and not perceived the forest by reason of the great number of trees. The best thing we can do is to listen to the truth and learn what we are ignorant of."

Professor Blumenbach, writing from Göttingen to Dr. Albers, of Bremen, on the 10th September, 1805, says: "I need not inform you that I congratulate myself uncommonly on having heard Dr. Gall. The views which he maintains about the organisation of the brain, the derivation of some of the supposed cerebral nerves from the spinal cord, etc., are to my mind extremely important."

Flourens, Gall's greatest antagonist, wrote of him as "*the profound observer whose genius has opened for us the study of the anatomy and physiology of the Brain.* I shall never forget the impression I received the first time I saw Gall dissect a brain. It seemed to me as if I had never seen this organ."

Geoffroy St. Hilaire, in a letter to Dr. Dannecy, said: "I shall always remember our astonishment, our sensations, our enthusiasm, on seeing Gall for the first time demonstrate his anatomical discoveries in the Jardin du Roi. The word brain will always call up to mind the name of Gall. The brain has brought him inextinguishable renown, and is entirely his, as much as the balloon is Montgolfier's, the moon is La Place's, and the fossil animals are Cuvier's."

Sir Astley Cooper declared in his lectures at the Royal College of Surgeons, London, that he knew nothing about the brain before he read Dr. Spurzheim's work.—(Ryan's *London Medical Journal*, 11th August, 1832.)

Sir Samuel Wilks, M.D., late President of the Royal College of Physicians, on Gall's Dissection of the Brain: "It was agreed that Gall dissected and unravelled the brain with a significance which had never before been accomplished, as Solly in his work testifies. In regarding the hemispheres as containing the organs of the mind and developed out of the lower perceptive ones, he traced out the columns from below into the hemispheres, and so unrolled the whole mass in a systematic manner. Combe says, 'The old plan was by cutting up the brain like a cheese; as if we could examine the anatomy of a limb by cutting it in slices like a round of beef.' Gall unravelled it; and *Reil, after witnessing one of his dissections in 1805 said, 'I have seen in the anatomical demonstration of the brain made by Gall, more than I thought that a man could discover in his whole lifetime.'* Blainville also said, that in researches of the brain and the nervous system Gall had given an impulse and direction altogether new. I must consider myself fortunate in having commenced my study of an

atomy when the old method of 'slicing' the brain to exhibit the *centrum ovale, majus* and *minus*, as above mentioned, had been discarded, and instead of this witnessed Mr. Hilton unravel the fibres of the brain, and trace them in their course in the beautiful manner his preparations and wax models so well display.

"Gall had shown, in 1804, the decussation of the pyramidal bodies, their passage through the pons, the existence of several layers of longitudinal and transverse fibres in the pons, the continuation of the optic nerves to the anterior pair of the corpora quadrigemina, of the diverging of fibres in the brain, the trophic centres, and enlargement of the cord, etc."—(Guy's *Hospital Reports*, 1879, vol. xxiv.)

3. Gall's Discoveries of the Mental Functions of the Brain

Spurzheim's and Combe's Phrenology

Anterior to Gall's teaching, mind was viewed as an intangible entity of incorporeal essence, and its disorders were thought to be incomprehensible afflictions. The brain was regarded merely as the source and centre of nervous influence, distributing the same, through the medium of the nerves, to the rest of the system. Even if Gall had succeeded in doing no more than establishing the now universally accepted fact that the brain is the organ of the mind, he has merited a foremost place of honour in the history of scientific discovery. His present-day antagonists forget that even very eminent men then thought, as Lord Jeffrey, editor of the *Edinburgh Review* at the time, wrote, "That there is not the smallest reason for supposing that the mind ever operates through the agency of any material organ."

Gall examined the complex nature of man through his material organisation. He studied the brain and nervous system, and drew his inferences from the facts which he observed; and concluded that the organic state is the correlate of the mental state, and that heredity casts light on the mental dispositions and aptitudes of man. He even looked at moral philosophy as a part of cerebral science. He compared the organisation of man with that of animals, traced the succession of the development of the brain and nervous system from the lowest type of animal life up to that which most closely approaches the human. Next he showed that even the human mind passes through stages in which it resembles lower organisms, and that we can fix no point of time at which distinctive human faculties awake. Thus he actually taught, a century ago, what the most eminent writers on mental science have recognised during the last few years only. He wrote in 1796 that the highest development of brain-matter is found in the cerebral hemispheres and convolutions, and that the gray surface of the brain is the material base of all mental and moral activity. This portion of the brain he viewed not as a single centre, but as consisting of a number of thoroughly differentiated centres, each one of which possesses particular functions, yet is in close connection with all the others. He even attempted to define a number of those centres, to determine their structure and individual energy, and to trace the physiological and pathological alterations which they undergo during the natural process of development up to maturity and decay, and in the diseases to which they are subject. Gall collected a great mass of exact observations on which solid conclusions could be based. He constantly compared brain development with mental development

in any persons who had any peculiarities of capacity or conduct, and only upon invariable experience of correlation did he make a localisation. While this part of the doctrine is that which was most violently opposed I have already shown in the main part of this work that *the discoveries which have since been made by other methods of research have confirmed a great number of Gall's localisations.*

Gall's publications are monuments of prolonged and arduous scientific labour, of which even the greater part of his followers, relying chiefly on Spurzheim's and Combe's exposition, remained ignorant. Gall's successors had neither his genius nor his character, nor even a clear conception of his method, and to their failings must be attributed, in great measure, the delay in the recognition of Gall. His doctrines were, unfortunately, judged by the public in general through the teaching of his disciples; and thus it happened that when he, near the end of his life, brought out his large work on the Brain and Nervous System, with plates showing the anatomy of the brain with an exactitude unknown at that time, he was already a contemned man, and his works were consequently left almost unnoticed. This is one of the reasons of the want of success of Gall's doctrine. Another is to be found in the nature of his teaching itself. Men succeed most easily who pander to superstitions and fashions; but as Gall has said: "To oppose received habits, to brave the decisions of learned societies, to expose conceit, to overturn the pretended knowledge of the anatomy and physiology of the nervous system, to destroy the systems of philosophy of 3000 years, etc., how can it be expected that one should succeed with such elements?"

Small wonder that Gall, who struck out new ideas in a domain of science where all lay in apparently impenetrable darkness, was treated like a criminal for his pains. If he was not stoned he was exiled from his native country. He was ridiculed and practically ostracised by the great bulk of the profession. Dulness would have been no crime; but that a man should leave the beaten track of commonplace, and propound so bold a theory as that of the encephalon being a complex organism subserving a variety of mental functions which it is worth while attempting to differentiate—this was intolerable.

It is certain that the greatest reformer must at first be in a minority of one. He for a time is the only believer in himself, while his opinions are generally derided as the enthusiastic delusions of a fanatical imagination or as the foolish creations of intellectual vanity. Well is it for him if he be not fiercely persecuted as a dangerous being, whom it is the duty of mankind in some way or other to silence. The world does not like its old-time convictions to be rudely disturbed.

Though it is certainly not the fashion now to stone or burn those who put forward new doctrines, yet such innovations are subjected still to much persecution. For the persecution of opinion in modern society is often as real as, and sometimes scarcely less cruel than, the torture of the stake, and he must be a strong man who can brave the world's censure, and rise despite thereof to acceptance and success.

During and since the time of Gall, a pack of wretched curs has been ever ready to snarl at this vigorous mastiff; yet I do not hesitate to proclaim that no work on mental science ever published was at once so profound,

original, and practical as his *Anatomie et Physiologie du Système Nerveux.* His ardour in collecting observations on man; the wide range over which his reflections extend; his examination of criminals, lunatics, and persons remarkable for some special faculty; furthermore his numerous researches into the mental characters of different animals, are all exhibited in this remarkable work, and no lover of truth, or of those who, under continuous opposition, persecution, and ridicule, alike from savants and theologians, continue to pursue their investigations, can fail to accord to the author the merit he so amply deserves.

The manner in which Gall proceeded in his researches necessarily led him at first to observe such persons as presented any special mental power in great action, generally in its abuse, and it was natural for him to designate it accordingly. He observed certain shapes of the head allied with certain talents or dispositions, and simply stated the fact without at first attempting to ascertain the original or fundamental power of the particular talent or faculty. Thus he named the different parts of the brain according to the abuses of the faculties with which he had found them connected.

In Gall's time there was no topographical anatomy of the surface of the brain, and for this reason the localisations are indicated sometimes vaguely, and are inadequately defined.

Spurzheim and Combe tried to ascertain the legitimate uses of the different faculties and to analyse them. Now this analysis of the faculties may be right or wrong; I have no intention to enquire into it within the limits of this book. So much, however, must I affirm, namely, that this premature completion of the system rendered an examination of Gall's discoveries by his own method

extremely difficult, and has thereby retarded the recognition of Gall's labours.

Gall, in the preface to the third volume of his *Anatomie et Physiologie du Système Nerveux*, etc., protests against the hasty conclusions, premature systematisation, and the introduction of "Phrenology" by his former pupil and assistant, Dr. Spurzheim, who had left him without ceremony to earn for himself glory in Great Britain. Here is an account of the relationship between Gall and Spurzheim by the Marquis Mosquati:

"From 1804 to 1807 Spurzheim was nothing else but the secretary and assistant to Gall. In 1806 I attended at Heidelberg the lectures of Gall, and I was witness as Spurzheim handed to him the casts and objects on which Gall was to make his remarks, in the same manner as when Dr. Faraday lectures at the Royal Institution there is always somebody to perform the mechanical part of the lecture.

"It must be allowed, however, that for the subsequent five years Spurzheim assisted his master so well in arranging his discoveries for publication that he was mentioned as joint author in the work on the *Anatomy and Physiology of the Nervous System.*

"In 1824 I saw Gall again at Paris. At this epoch Spurzheim had remodelled the system of Gall, and had called it Phrenology. I must say that Gall was not pleased with his innovations, and more than once in my presence spoke violently against him, calling him a plagiarist and a quack."

Spurzheim only joined Gall after obtaining his qualification in 1804, when Gall had already made most of his discoveries. Those who mention 1800 include the time of his student days, when he dissected under Gall's guidance. Spurzheim separated from Gall in 1814,

proceeded to Vienna to take his degree of M.D., then tried Paris unsuccessfully and eventually England.

Dr. Elliotson, F.R.S., Professor of Medicine in University College, London, showed the injustice of Dr. Spurzheim towards Gall, his vile attempts to share with Gall discoveries in which he had taken no part, and to make it appear that he had rendered systematic and philosophical what had been in Gall's hands merely rude and detached facts. "After reading some of Dr. Spurzheim's first English work, published on his arrival in England, Gall gave the book with disgust, only half cut, to Dr. Fossati, and knew nothing more of Dr. Spurzheim's sayings and writings afterwards than what was pointed out to him, and it was with the greatest difficulty that he could be prevailed upon to take any notice, even for a moment, of what was pointed out to him. *I know none among the advocates of Dr. Spurzheim who is not miserably ignorant of the writings of Gall and of the history of phrenology*, and has not derived his knowledge second-hand from Dr. Spurzheim, or from one taught by him, and few who are not most unjust to Gall."

George Combe, in his reply to Dr. Roget, says, "The title which Gall and Spurzheim give to their science is Phrenology." Now Gall nowhere calls it phrenology. He invariably contents himself with the expression, "Functions of the Brain."

Gall never undertook the construction of a *system* of psychology — in fact, he expressly disclaimed the pretension of doing so; he simply announced, as a fact, that observation showed that the development of a certain part of the brain was associated with the tendency to act in a certain manner, or with the capacity for doing a certain thing.

The question of the founder was not as to whether or not we can tell people's characters by examining their brains or heads, but whether we may thereby establish the physiology of the brain.

Gall wrote in 1796, long before the publication of his work: "They call me craniologist, and the science, which I have discovered, craniology. I rather think that the wise men have baptised the child before it was born. The object of my researches is the *brain*. The cranium is only a faithful cast of the external surface of the brain, and is consequently but a minor part of the principal object.

"Allow me to touch upon two important defects in my work. First, I should have conformed more to the spirit of the age, and ought to have maintained that we could absolutely ascertain by the shape of the skull and the head *all* the faculties without exception, and instead of investigating I ought to have made the whole a speculative study. People are not charmed at, or interested in, a science which is hard to acquire. The premature judgments which have been pronounced, the jokes and squibs which have been let off at my expense, even before my intention or my object became known, go to prove that men do not wait for research in order to draw their conclusions."

The remark made by Sir John Forbes, F.R.S., in the *British and Foreign Medical Review*, is as true today as it was in 1840: "We have heard and read much in opposition to Phrenology, and we can affirm that *the Phrenology opposed was scarcely ever that of Gall*, but usually its miserable caricature as exhibited by half-informed enthusiasts."

Dr. John Elliotson wrote: "Gall's works are clear, flowing, full, at once rigidly philosophical, and rich

with profound thoughts and glowing illustrations. I never take them up without finding something fresh, and feeling that I am with one of that band of mighty minds to which Bacon, Shakespeare, Milton, etc., belonged. They speak for themselves, and are totally different from the writings of Dr. Spurzheim ; and yet Gall's writings are unknown to the greater part of the physiologists of the present day. It was Gall's facts that made Dr. Spurzheim a phrenologist."—(*Lancet*, 25th November, 1837.)

Yet whatever may be said against the details of Spurzheim's and Combe's system of phrenology, we should not forget that it is based on Gall's discoveries; and if we accept these as being thoroughly sound we must also acknowledge the foundation of the other.

4. The State of Phrenology Fifty Years Ago

If phrenology were all rubbish, how comes it that after and despite the opposition it encountered, it was accepted by so considerable a number of men of mark? Why did it act as such a stimulus to the advance of cerebral anatomy and physiology, and not only so, but to the adoption of social reforms which depended for their right understanding upon correct views of the relations obtaining between men's physical and mental constitution? Why did Gall's discoveries, if only the outcome of his imagination, and not the result of his observation, give rise to the reform in the treatment of the insane at the beginning of the last century?

Amongst Gall's followers in Paris were Andral, Broussais, Bouillaud, Blondeau, Claude Bernard, Cloquet, Falret, Ferrus, Fossati, Foville, Jolly,

Le Gallois, Regnard, Royer, Voisin, etc., all physicians who have achieved renown.

Dr. Vimont made a collection of skulls, brains, casts, and drawings, amounting to several thousands, at a cost of 75,000 francs=£3000, to upset the science, so hostile was he to it. Yet when he came to examine his collection with due attention he was actually *converted*, through its instrumentality, to a belief in the doctrines of Gall. Dr. Vimont subsequently gave instruction in phrenology to the late Duke of Orleans.

Dr. Broussais, who confirmed Gall's observations, says: "I assure you that it has not been from rashness, nor without reflection and numerous observations, that I have ventured to take up the defence of Phrenology. I have multiplied observations, so far as it has been possible for me to do so, ere entering the lists of its defenders."

Though some of the conclusions of Dr. Gall and his disciples may be considered immature, they are worthy of respect, as being well-tried deductions from observations on many fields of research by numerous inquirers. Few people are really aware how extensive at one time were the collections of crania, casts, and drawings bearing on this subject. The *Encyclopædia Britannica* states that "Gall's Paris collection contained 354 skulls, casts of skulls, and brains, besides 258 other anatomical preparations. The Edinburgh Museum contained 463 skulls, 280 busts, and 100 masks of eminent or notorious individuals. Mr. Deville, at his death in 1846, left 5450 objects, including 2450 crania and other illustrations of phrenology. Mr. Deville was a practical observer, and took 1500 casts of heads from living persons. Dr. Vimont had 2500 crania of animals, illustrating the truth of Gall's doctrine. Dr. S. C. Morton's collection

in 1841 contained over 1000 crania, of which more than 500 were human skulls."

In addition to these the *London Phrenological Society* owned 300 to 400 specimens; Dr. Spurzheim, 800 to 900; Mr. Holm, 300 to 400.

The *London Phrenological Society* was destroyed by the introduction of materialism and mesmerism. It consisted of 300 members, 100 of whom were medical men.

In 1836 the *Edinburgh Phrenological Society* numbered 630 members, 105 of whom were doctors.

In Glasgow all the college professors belonged to the "Phrenological Society." There was a "Chair of Phrenology" at the Andersonian University of that town.

Lectures on phrenology were given at the London and St. Thomas's Hospitals, and at the London Institution.

Sir Henry Holland, M.D., was a member of the "Manchester Phrenological Society," Sir G. S. Mackenzie of the "Aberdeen Society," and Sir J. Mackenzie of the "Edinburgh Society."

Amongst active defenders of phrenology, men of great repute, might be mentioned in addition: Sir John Forbes, M.D., Sir James Clark, Physician to her late Majesty, Dr. Elliotson, F.R.S., Mr. H. Atkinson, Sir W. C. Ellis, Dr. William Gregory, Dr. Whately, Archbishop of Dublin, Dr. Engeldue, Dr. Conolly, Sir James Coxe, and Dr. W. A. F. Browne (father of Sir James Crichton-Browne).

At that time phrenology, though strongly opposed by the majority of metaphysicians and other scientists, was not ranked in a category of opprobrium. On the contrary it had risen to a place of honour, for phrenology

meant then what the word actually implies, a doctrine of the mind. George Combe, the celebrated author of *The Constitution of Man*, was then its chief and much-respected defender. Combe was consulted by British and foreign royalty, and many of the leading members of the aristocracy obtained their phrenological developments, as for instance, Lord and Lady Clarendon, Lord Granville, Lord and Lady Lansdowne. Others asked his advice regarding the *education of their children*, as the Duchess of Sutherland, the Duchess of Buccleuch, Lord and Lady John Russell, Lady Romilly, etc. The Duchess of Argyle brought her two eldest sons, the Marquis of Lorne and Lord Archibald Campbell, to Combe, in order to obtain an account of their phrenological organisation. In 1846 George Combe was invited to Buckingham Palace, where he was presented to Prince Albert, and was for the first time permitted to examine the phrenological development of the Prince of Wales, the Princess Alice, and Prince Alfred (Duke of Edinburgh). In subsequent years he was called upon to repeat the examination, and his views as to the course of education best suited to the capacities of the royal children, and as to the qualifications needful in their instructors, obtained consideration. The esteem with which the royal family of Great Britain regarded Combe may be estimated by the following autograph letter from the Prince Consort:

My Dear Mr. Combe—You have been several times so good as to give me a portrait of the phrenological conformation of our children. I take the liberty to-day of sending you Winterhalter's view of their physiognomies. May you, in looking on them sometimes, remember that their parents are very sensible of the kind interest you have taken in their welfare. I likewise send you an illustrated catalogue of the Exhibition, knowing that you have taken a lively interest in that child of mine also,

AN INTELLECTUAL AND VERY AFFECTIONATE BOY.

Notice the development of the frontal and occipital regions.

I

Observe the differences in the heads of these two boys.

II

A BOY WITH DEFICIENT REASONING AND RETENTIVE POWER AND LITTLE CONTROL OVER HIS PROPENSITIES.

Notice the depressed forehead.

etc., etc. Hoping that you are quite well, believe me, always, yours truly, ALBERT.

WINDSOR CASTLE, 26*th October*, 1851.

5. The Disrepute of Phrenology caused by Ignorant Professionals

It may be expedient to enquire how it came about that what figured sixty years ago as a science to many medical and other investigators, who put together masses of studious discussion, as careful in method as any research of the time, has for over a generation come to be left so largely in the hands of itinerant "professors," and to be simply ignored by the medical profession.

First of all we must bear in mind that there is no restriction on phrenological quacks, and were medical quacks not restricted and repressed by rigorous laws there would certainly be thousands more of them. Furthermore, have not the now well-established phenomena of hypnotism been treated by the medical profession till very recent times as products of mere imposture?

Why is phrenology to remain relegated to the quacks? Is it because it does not suit medical men to give it countenance? I have come across some eminent men in the profession who have avowed that to oppose phrenology at the present day is alike ridiculous and unjust, but that popular prejudice is too strong for them openly to acknowledge the matter. They would incur the risk of being ostracised, and they cannot be expected to quarrel with their means of living. As Mr. John Morley says: "To accept phrenology in these days stamps a man as unscientific."

We denounce these humble practitioners as the great enemies of phrenology, as having degraded it, and rendered it disgusting to superior minds; but should we not deal charitably with these offenders? They have merely done what men of higher level had left undone. Exactly as in the case of hypnotism. The travelling hypnotist and platform entertainer kept the subject alive till the rise of Heidenhain, Charcot, Bernheim, Bramwell, etc. The practical phrenologist not only boldly proclaimed his own conviction of the truth of his science, but he applied it to the best of his ability. Why has no educated phrenologist substituted a better practice in its place? Where is the medical man who has tried in Gall's direction to ascertain from the external configuration of the skull what information can be gained therefrom? Yet without a single counterproof, the mass of learned men is quite ready to denounce the subject as "a fraud."

In one respect the quack phrenologist has done infinite harm. It is due to his lack of knowledge that the idea of "bumps" has arisen. Nine men out of ten, if asked to-day for a definition of phrenology, would answer with Dr. D. J. Hill: "A pseudo-science which professes to localise mental faculties by excrescences on the cranium" (*Elements of Psychology*, 1900, p. 214). Readers who have followed me thus far will at once see the utter falseness of such statement. But I myself have had to listen to the same kind of thing in my medical school.

It is specially to be noted that Gall repudiated the vulgar idea of the science as a process of detecting "bumps." "The bumps of the antiphrenological buffoons" is one of his contemptuous phrases for the cheaply facetious methods of his popular opponents.

It is true that a few of the plates of Gall's large work give one the notion of protuberances, but then we should bear in mind that these divisions were made in order to facilitate the study of the localisations, and not to convey the idea that a centre is large only when it presents a protuberance. It is the inevitable tendency of amateurs to take the short and easy method of looking for single bumps, but the opponents of phrenology need not launch out too much against "bumps," for in practice it is they who look for them most readily. Thus Flechsig believes to have discovered the "bumps" of music in the skulls of Bach and Beethoven (see p. 107).

The dissectors of Gambetta's brain drew special attention to the fact that the cortical structure in the neighbourhood of Broca's convolution was *markedly augmented*, and a writer in the *British Medical Journal*, 31st July, 1886, says: "When we recall the fact that Broca, in his memoirs, attributes to this part of the cerebral cortex the function of articulate language, the unusual development of this convolution in Gambetta and others confirms, to a certain extent, this opinion, now generally accepted. Gambetta was a great orator, his memory for words being most remarkable; he had acquired a rapid and most exact method of expressing his ideas. It is, therefore, somewhat admissible to associate his great oratorical power with his increased growth of cortical tissue in the neighbourhood of Broca's convolution."

Since so many men regard phrenology as a science of "bumps," the following remarks by the *Lancet* (6th February, 1824) are worth noting:

"Certain individuals who *profess* to be acquainted with phrenology believe that each cerebral organ,

when largely developed, is marked by a corresponding protuberance of the skull, and unless there be a manifest projection at the part where the organ is said to be situated, they altogether deny its existence. Nothing—be its form what it may—less than a decided *bump* will satisfy them, whether circular, quadrangular, hexangular, or octangular, no matter; let there be a bump, a sort of cerebral hernia, all is right, and the wiseacres are convinced. Now they are pleased to denominate this a part of the phrenological system—aye, its distinguishing feature, the principle upon which the doctrine is founded—the test by which one can discover its truth or falsehood; with many other observations, equally remarkable for their want of veracity. It is really astonishing that authors who have just claims to literary and philosophic fame, should sacrifice or blur their dearly won reputation by such inconsiderate assertions, for it is evident they have assumed the right of writing upon a subject which they do not comprehend, and of denouncing it without having investigated its principles.

"We are at a loss to conceive from what source this bump doctrine could have emanated—not from anything contained in the works of Drs. Gall and Spurzheim certainly, for they unhesitatingly and broadly declare that they can describe a character more correctly by looking at a cranium than by feeling it—by observing its general appearance rather than by confining their remarks to any particular situation."

CHAPTER X

THE OPPOSITION TO PHRENOLOGY

1. Introduction.

   Misrepresentation and sarcasm instead of serious argument—Criticism of toy busts, but not of Gall's works—Gall's discoveries rediscovered within recent years—Flourens, Abernethy, Sir Astley Cooper, on "Phrenology."

2. Herbert Spencer on Phrenology.

   Herbert Spencer as a phrenologist — His contribution to the *Zoist*—The *Principles of Psychology* based on phrenology—Dr. Maudsley on phrenology.

3. Dr. Charlton Bastian on Phrenology.
4. Dr. Andrew Wilson on Phrenology.
5. Mental Science as taught by an M.D. (Gold-Medallist).
6. Hitzig, Flechsig, and Meynert on Phrenology.
7. Napoleon and Gall.

CHAPTER X

THE OPPOSITION TO PHRENOLOGY

1. Introduction

NOT the least of the faults of the opponents of phrenology is the lack of that respectful observance, which should mark not only the intercourse of polished minds, but every form of intercourse in which either letters or science is concerned. Moreover, the arts and devices of the cavilling sciolist too often usurp in their productions the place which ought to be occupied by the facts and arguments of the conscientious inquirer. Their writings are frequently pervaded by a determined spirit of falsification and obloquy, to an extent that has scarcely a parallel. Those who wish to see how far professed men of science, inspired by prejudice, can deviate from scientific righteousness, should read the false records and interpretations given of the American "Crowbar Case."

Most opponents resort to assertions instead of facts, misrepresent the character and tendency of phrenology, misstate the views and declarations of its advocates, deal in worn-out wit or sarcasm, when they should examine and discuss, substituting invective or insidious imputations for serious argument, and addressing themselves to the feelings and prejudices instead of to the

understanding. Rarely is there any trace of originality discoverable in them. The allegations of most modern writers are but the mouldy remains of the sophistry of their predecessors. I have read all the arguments which have been advanced against Gall's doctrine in the literature of the past century. Misrepresentation, libel, and malice from the outset, the selfsame attacks have been re-echoed in every generation, and if I reply to modern opponents with more civility than they have employed and they deserve, it is because of the great cause I am upholding. To reply to all is not possible, and would be futile; but there are some criticisms uttered by men of such high standing or such popularity that they derive from the position of the authors a degree of consideration of which they would otherwise be unworthy.

What condemns all the critics of phrenology, whether contemporaries of Gall or young men of the present period, is this great fact, that not one of them seems to have read Gall's great work, *Anatomie et Physiologie du Système Nerveux.* Even the followers of Gall, some being medical men of high position and repute, whose testimony I shall cite in the succeeding chapter, have contented themselves with a perusal of Gall's more popular work, *Les fonctions du cerveau.* No justice will be done to either Gall or phrenology until Gall's master-work is studied from cover to cover.

Gall *made nothing, but simply recorded what he saw existing in nature.* His teachings being simple statements of the results of observation, they can only be refuted by showing that the observations have been made incorrectly or that the results are incorrectly stated. Any man who objects to them without attempting to do this is simply finding fault with nature.

In setting up his own ideas as superior to these inductions he is virtually asserting that the brain is not properly constituted, as it would have been had *he* been consulted in its creation.

A curious attitude has been adopted by some of the leading authorities of learned societies and medical journals. It is to the effect that their mind on this subject was quite made up long ago; they do not need any fresh evidence. We should have thought that if the localisation of mental functions is regarded as impossible and that phrenology is to be looked upon as the greatest fraud of the past century, the authorities of such societies should be only too pleased to discuss whatever new facts the author may bring forward, and then state their reasons for dissenting from his views. Even fallacies sometimes contain a kernel of truth. Practical experience has taught us that we were mistaken in holding this view. It may be that their mind on this subject is already made up beforehand, but I feel sure that, while this may be true in the case of some, as regards others—and they are the most vehement in their opposition to admit of any discussion on the subject—it is nothing but the fear that such a discussion may reveal to the younger generation:

1. How very near we have got to phrenology during the last few years.

2. How many reputations were built up by an adoption—without acknowledgment—of the teachings of phrenology.

3. How very reprehensible was our mode of action during the whole of the past century in neglecting this subject; and not merely rejecting it, but even persecuting those who confessed to a belief in it,—remember Dr. Elliotson,—so that a man who values his reputation

dare not at the present day venture to proclaim his leaning towards it.

"This bubble has been so often and so demonstratively exploded that we scarcely think men of science are bound any more to trouble their heads about it."—(Sir Spencer Wells on *Phrenology*.)

" We had imagined that phrenology had been judged and condemned long ago, and sank into an enormous grave where lie buried so many other huge and popular delusions. . . . We must beg our phrenological friends not to prosecute this subject further. *People have all made up their minds about phrenology.* A *few* believe in it, and most think it no 'logos' of the mind at all."—(*British Medical Journal*, editorial remarks, 26th October and 14th December, 1861.)

The *British Medical Journal* on this occasion merely imitated the *Edinburgh Review*, albeit in politer language. The latter journal wrote: "To enter on a particular refutation of them [the opinions of Gall and Spurzheim] would be to insult the understandings of our readers. Indeed, we will flatter the authors so far as to say that their observations are of a nature to set criticism at defiance. They are a collection of mere absurdities, without truth, connection, or consistency; an incoherent rhapsody, which nothing could have induced any man to have presented to the public, under a pretence of instructing them, but absolute insanity, gross ignorance, or the most matchless arrogance. . . . Such is the trash, the despicable trumpery, which two men, calling themselves scientific enquirers, have the impudence gravely to present to the nineteenth century, as specimens of reasoning and induction."

The mind of the opponents of phrenology was made up at the time of Gall, even before he had published

his evidence, and has remained unaltered for an entire century, notwithstanding the advance of knowledge which has led to the removal of the barrier which separated Gall's doctrine from the rest of science. For we must remember that *the chief obstacle to its acknowledgment was the denial of the plurality of the functions of the brain, which is now admitted.*

It was Flourens who had given the death-blow to Gall's doctrine, and yet there is not a man to-day who accepts his deductions.

To test Gall's teachings, the Academy of France commissioned Flourens to make an experimental investigation. Flourens destroyed *pigeons'* brains in successive stages, and as a result of his observations declared that the whole cerebral mass is homogeneous, that nothing prevents the functions of one part from being transferred to another, and that it would not be contradictory to anything we already know, if, after the entire destruction of the hemispheres, the intellectual faculties or consciousness should still remain.

Flourens's report was accepted by the Academy, and it was regarded as a fatal blow to Gall's position; but his experiments were in their turn set aside sixty years later, having been wrongly conducted, and only on animals too low in the scale of organisation to show the highly complex functions with which the human brain is endowed.

Not only has a mass of material been collected during the last thirty years in favour of the localisation of functions of the brain, but many of Gall's discoveries have been *rediscovered*, as I have shown. If, therefore, the opponents of phrenology still adhere to the objections which they thought out for themselves from insufficient data in the days of their youth, or, as

is more likely, acquired from their elders, whether parents or teachers, unconscious of, or wilfully blind to, the fact that science has now proved them to have no foundation, the state of mind of such opponents must be on a par with that of the pike in Möbius's experiment. The experiment which Professor Möbius made proved that a pike requires three months to establish an association of ideas between particular kinds of prey and the fact of their being protected by an invisible wall. This fact was proved by the pike repeatedly dashing its nose against a glass partition in its tank in fruitless efforts to catch minnows which were confined on the other side of the partition. At the end of three months, however, the requisite association was established, and the pike, having learned that its efforts were of no use, ceased to continue them. The sheet of glass was then removed; but the now firmly established association of ideas never seems to have become disestablished, for the pike never afterwards attacked the minnows, though it fed voraciously on all other kinds of fish. From this we see that a pike is very slow in forming his ideas, and no less slow in again unforming them, thus resembling many respectable members of a higher community, who spend one-half of their lives in assimilating the obsolete ideas of their forefathers, and through the other half of their lives stick to these ideas as being the only possible truths; they never can learn when the hand of science has removed a glass partition.

"Our mind is made up about it as it is made up about mesmerism," writes Sir Spencer Wells. Yet mesmerism, or hypnotism, if not generally accepted, has at least been tolerated within recent years. Sir Spencer Wells's mind was made up, and hence he would

not investigate. In this case he was just as devoid of a true philosophic spirit as Dr. Robert Lee was in opposing ovariotomy. As Dr. Savage remarks (*Lancet*, November, 1862): "Dr. Lee never would see the operation of ovariotomy done. He (Dr. Savage) had asked him to come and see a case, but Dr. Lee said he would rather not. Dr. Lee had expressed strong opinions against ovariotomy, and he did not want to see anything which would alter his opinions." Dr. Lee replied: "It was true that he had never performed the operation of ovariotomy on the living body, that he had never sanctioned its performance, and that he had never seen it performed by others."

Orthodox science will not tolerate scientific heresies. It cannot burn its heretics, but it can excommunicate them. In every age prejudice, ignorance, and self-interest have formed a barrier to the reception of truth. The question regarding phrenology is not, Is it true? but, How will it square with our favourite theories?

Was not Harvey persecuted? Was not the immortal Jenner ridiculed, persecuted, and oppressed? When Jenner introduced his favourite topic at the Medical Club he was threatened with expulsion, and the subject was denounced as a nuisance. The opposition, however, did not stop here, since he was actually prevented from publishing the results of his experiments in the *Transactions of the Royal Society.*

The Royal Society would not permit the publication in its *Transactions* of Dr. Marshall Hall's early papers on his great and highly important discoveries on the Nervous System! This conduct is just on a par with that of the Faculty of Medicine of Paris, which carried their blind opposition to practical knowledge so far as

to refuse permission to Ambrose Parr for the printing of his invaluable discovery of the application of ligatures to arteries.

Not that persecution is an absolute test of truth, because error may be, and sometimes gets persecuted.

The late Professor Ucelli was deprived of his chair in the University of Florence, and after his death all biographical accounts of him were prohibited, merely because he professed his belief in phrenology. Dr. Ferrarese of Naples was called before the Holy Tribunal for having written in favour of phrenology, and was actually imprisoned for twenty-eight days in the year 1840.

The advocates of phrenology could not be corporally punished in Great Britain in the nineteenth century, but they met with a very hot reception in the form of ridicule and abuse of every imaginable description. "These infernal idiots, the phrenologists!"—(*Blackwood's Magazine*, Nos. 72 and 76). "Such ignorant and interested quacks as the craniologist, Dr. Gall!"—(*Quarterly Review*). "This bubble! What outrage on common sense, on natural laws, on scientific facts, will men not teach and men believe!"—(*London Medical Times and Gazette*, 15th December, 1860.)

Baron Cuvier, swayed by the adverse opinion of Bonaparte at the Levée, drew up a report for the French Institute on the labours of Gall in direct opposition to the sentiments expressed by him in private society.

Different to Cuvier was Abernethy, who, though at first an opponent, later wrote favourably on phrenology, and quieted his Scotch countrymen who had religious objections against the new doctrine. Abernethy even invited Dr. Spurzheim to give a series of demonstra-

tions on the brain to the pupils at St. Bartholomew's Hospital and resigned his chair to Dr. Spurzheim on these occasions.

Sir Joseph Banks openly proclaimed it "damned nonsense"; on the other hand, Sir Astley Cooper pronounced phrenology to be calculated to bring immortality to its author.

When Mr. Epps, one of the earliest advocates of phrenology, gave an address at the Westminster Medical Society, 5th April, 1828, on "Insanity," Mr. Bennett replied, "that he could not assent to the proposition of the author of the paper that mind comes from matter. He stated that there is no perceptible difference between the brain of man and of animals." —(*Lancet*, 19th April, 1828.)

In a previous chapter I have shown Gall's wonderful discoveries of the structure of the nervous system. Yet Sir Charles Bell accused Gall of not comprehending the great division of the nervous system, and not *knowing the difference between the cerebrum and the cerebellum* (lecture at the Royal Society, London, 19th June, 1823). Sir Charles Bell was a great man, and many people will have believed him. They thereby saved themselves the trouble of even opening the work of Gall. Never were there finer engravings of the brain than those to be found in this work. But why should we look? Have we not already made up our mind?

Even those modern experimenters on the brain who are conscious of having proved some of Gall's localisations, dare not acknowledge the fact. Thus an antiphrenologist, who was at least thorough in his antagonism, and saw that all localisation must lead to a phrenology, wrote: "What shall we say of these phrenological (!) butcheries for the sake of gratifying

a foolish curiosity respecting the functions of peculiar portions of the brain?"

Had Gall discovered only a new foramen in the skull, or a new fissure in the brain, every medical student would know his name. But because he revolutionised the whole knowledge of the structure and functions of the brain by his numerous discoveries, he was not understood, and in the end disregarded.

2. Herbert Spencer on Phrenology

(Extract from the author's article, "Herbert Spencer as a Phrenologist," which appeared in the *Westminster Review*, February, 1893.)

Sir John Forbes, F.R.S., in the *British and Foreign Medical Review* wrote: "We are acquainted with medical and educational works which have gained no small repute from the copious but unacknowledged use they have made of the doctrine of phrenology, and the reputation of which depends chiefly on their borrowed views. We have sometimes, indeed, been tempted to smile at the ready acceptance which strictly phrenological ideas have met with when thus stolen and offered at second-hand, only a little altered in dress to prevent their paternity being traced. But, much as we rejoice in the diffusion of useful truth, we cannot refrain from condemning this plan of acquiring a temporary popularity at the expense of science, and we are glad that the risk of detection will soon become so great as to deter most men from such unscrupulous conduct. It may seem, at first view, a light matter thus to put forth a truth in disguise; but in reality its forced separation from the principles which alone render its application safe and advantageous deprives

it of much of its practical value; and it is for this reason, as well as for its dishonesty, that we object to the practice."

It is a long time since the above was written, but it holds perfectly true even at the present day. Knowing that phrenology is not admitted as a subject for scientific discussion, and that even in private life a person expressing belief in it may run the risk of being considered a "crank," some authors have thought themselves very safe in *adopting* what they found useful in phrenology for their purpose, and hiding the fact by denouncing the subject and its originator in terms sometimes so strong as to be unworthy of a great man.

These are the men who shout loudest against phrenology, who prevent any discussion of the subject, who will call for vigorous measures against such a heretic. When a man at the present day denounces phrenology, though it is reputed to have been killed over and over again, and though he knows that, since the death of George Combe, that is to say for some forty years, there is no one to reply, is it not self-evident that such a man must have a motive? It is not British conduct to kick a fallen foe. The motive is that he has something to hide.

Modern men are so ignorant of the writings of Spurzheim and Combe that they have never noticed how beautifully Herbert Spencer has worked out their theories in his *Principles of Psychology*. I suppose they rested satisfied with the fact that Mr. Spencer had "kicked the fallen foe" in a particular part of the book, —Mr. Spencer, of all men, who had such an intimate knowledge of phrenology, that he even read "heads" correctly, of course a long time ago.

Dr. James Hunt, President of the Anthropological

Institute, said in the *Journal* of that Society, vol. v., p. 214: "Mr. Spencer speaks of 'the unscientific reasonings of the phrenologists,' and yet there is perhaps no modern writer on psychology who has so blindly accepted the fundamental principles of phrenology as he has done. Mr. Spencer accepts all the chief principles of the phrenologists, often, however, without due acknowledgment, and at the same time sneers at the conduct of physiologists for not accepting the same 'as being in harmony with the course of controversies in general.' The only difference between the utterances of Dr. Gall and Mr. Spencer is that the one gives his opinion on the special localisation of the faculties as a man of science and observation, and the other as a dogmatic philosopher. Mr. Spencer says, 'Localisation of function is the law of all organisation whatever; separateness of duty is universally accompanied with separateness of structure, and it would be marvellous were an exception to exist in the cerebral hemispheres.' Mr. Spencer, indeed, goes still further than Gall, or, I believe, any of his followers, in his application of the doctrine of phrenology to comparative anthropology."

In an article on "First Principles," M. Auguste Laugel, editor of the *Revue des Deux Mondes*, described Mr. Herbert Spencer as a follower of Comte, and said that Comte's influence is easily recognisable. Mr. Spencer protested against this statement in a pamphlet, "Reasons for Dissenting from the Philosophy of Comte." Seeing that both took Gall as their authority (Auguste Comte acknowledging the fact, but Mr. Spencer ignoring it), M. Laugel's error is easily explained.

We must not forget that, at the time of the publication of the *Principles of Psychology*, there was not a single authority in favour of the plurality of functions

of the brain except Gall's own followers. The two authorities whom Mr. Spencer mentions in his defence against the supposed similarities between his writings and those of Comte—Sir William Hamilton and Flourens—wrote the reverse of what he advocated.

The former, in his lectures on Metaphysics (p. 264), says: "No assistance is afforded to mental philosophy by the examination of the nervous system, and doctrine or doctrines founded on the supposed parallelism of brain and mind are, as far as observation extends, wholly groundless."

Flourens, another teacher, held a similar view to Hamilton, and supported it by experiments which held good for half a century. Sir William Hamilton and Dr. Flourens were supposed to have dealt phrenology its death-blow. But what is that worth now? Flourens dogmatically lays down the law accepted by scientific men for fifty years that "the brain is a single organ, that no individual part acts by itself, and that by slicing off the brain the functions are preserved." It is really difficult to realise that such theories could have prevailed so long.

It was not until 1870 that these investigations were shown to have been wrongly conducted. Scientists relied on the evidence furnished by Flourens when they condemned Gall, and his experiments seemed to show that the brain acts as a single organ, inasmuch as by slicing off various parts none of its functions seem to be impaired. Yet how is it, if Sir William Hamilton and Flourens were Mr. Spencer's authorities, that the latter wrote in the *Principles of Psychology* on the question of plurality of the functions of the brain as follows:

"Whoever calmly considers the question cannot long

resist the conviction that different parts of the cerebrum must, in some way or other, subserve different kinds of mental action. Localisation of function is the law of all organisation whatever, and it would be marvellous were there here an exception. If it be admitted that the cerebral hemispheres are the seats of the higher psychical activities, there are distinctions of kind which, though not definite, are yet practically recognisable; it cannot be denied, without going in direct opposition to established physiological principles, that these more or less distinct kinds of psychical activity must be carried on in more or less distinct parts of the cerebral hemispheres. To question this is to ignore the truths of nerve physiology, as well as those of physiology in general. It is proved experimentally that every bundle of nerve-fibres and every ganglion has a special duty, and that each part of every such bundle and every such ganglion has a duty still more special. Can it be, then, that in the great hemispherical ganglia alone this specialisation of duty does not hold? That there are no conspicuous divisions here is true; but it is also true in other cases where there are undeniable differences of function—instance the spinal cord, or one of the great nerve bundles. Just as there are aggregated together in a sciatic nerve an immense number of fibres, each of which has a particular office referring to some one part of the leg, but all of which have for their joint duty the management of the leg as a whole, so in any one region of the cerebrum each fibre may be concluded to have some particular office which, in common with the particular offices of the neighbouring fibres, is merged in some general office fulfilled by that region of the cerebrum. Any other hypothesis seems to me, on the face of it,

untenable. Either there is some arrangement, some organisation in the cerebrum, or there is none.

"If there is no organisation, the cerebrum is a chaotic mass of fibres, incapable of performing any orderly action. If there is some organisation it must consist in that same physiological division of labour in which all organisation consists, and there is no division of labour, physiological or other, but what involves the concentration of special kinds of activity in special places."

Thus Mr. Herbert Spencer advocated a view forty-five or fifty years ago, which was then held only by Gall's followers, in opposition to the majority of the great thinking men. Both Sir William Hamilton and, later, John Stuart Mill relied on the evidence furnished by Flourens in Paris, that mental phenomena do not admit of being deduced from the physiological laws of our nervous organisation. Even a physiologist of such eminence as Dr. Carpenter relied on Flourens, and asserted that the cerebral hemispheres, as the organs of thought, "do not act in isolated portions, but as a whole"; but abandoned this view when he became acquainted with the results of experiments made after 1870. Yet the *Times*, not being acquainted with the change of opinion, credited him with the old view, which Dr. Carpenter had to contradict in a letter to the *Times*, 27th September, 1873.

Herbert Spencer, however, baffles his readers by saying: "The crudity of their philosophy is such as may well make men, who to some extent agree with them, *refrain from avowal of their agreement*, more especially when they are met by so great an unwillingness to listen to any criticisms on the detailed scheme rashly promulgated as finally settled."

There we have the truth from Herbert Spencer. His speculative articles on phrenology in the *Zoïst*, vols. i. and ii. (see Chapter VI.), did not find favour with George Combe; hence Mr. Spencer turned round on phrenology, "adopted" those principles which he found suitable for his purpose, "*but refrained from avowal*" of the source of his information.

The things to which Mr. Herbert Spencer objects in the phrenological doctrine were not created by Gall and are too paltry for consideration.

Here is a quotation from yet another author who would appear to have assimilated "the phrenological teachings as they were then current," as one can readily infer by comparing his books with those of "phrenological" writers.

Dr. Henry Maudsley: "As Mr. Spencer does not on any occasion give references to or make quotations from authors who have preceded him, but works up their results systematically into his lucid exposition, those who gain all their knowledge of philosophy from the most recent and popular expositions of it, and ascribe to their authors all they find there, are prone to think original that which is often a legacy from the past. This practice of ignoring authorities, though it no doubt has its conveniences, bears hardly and disagreeably sometimes on those who may have occasion to write upon the same subjects, inasmuch as they are liable to be charged by ignorant persons with borrowing from an eminent contemporary what the contemporary has really derived from the same well-known source and would not claim as his own. This is trying."

Though Dr. Maudsley, son-in-law of the great Conolly, whose testimony as to the usefulness of phren-

ology is cited farther on, assimilated the general teachings of phrenologists and expanded thereon, as may be seen from his works on *Body and Mind* and *Pathology of Mind,* he has likewise taken to criticising phrenology, and this in the most frivolous fashion. He tested the organ "the love of life" in patients who were either very desirous of preserving their existence or were tired of it. Dr. Maudsley says that phrenologists locate this faculty in *front* of the ear, and that he found the location correct only in one out of many cases.

I grieve for Dr. Maudsley that he did not deem fitting to select one of Gall's or Spurzheim's own localisations to whom "love of life" was unknown. George Combe, moreover, who claims the discovery, located it *behind* the ear, in the posterior part of the temporal convolutions, and *not in front.*

Furthermore, with a view to ascertain the truth of phrenology by actual measurement, Dr. Maudsley compared the size of the patient's head with that of a *model bust.* Who would have thought of comparing the dimensions of a living head with that of a plaster cast? This is how "scientists" have tested phrenology.

This incident cannot be regarded in the light of a mere joke. The subject is all too serious for such arrant trifling.

3. Charlton Bastian, M.D., F.R.S., on Phrenology

Phrenology has been dead for over a generation; it has not had a scientific exponent since the death of George Combe; it has dwindled down to a mere system of head-manipulation and character-reading. What then can have caused some men of high station and

dignity to stoop from their eminence to notice things so far beneath them?

The most ridiculous assertions have been and continue to be made by critics supposed to be acquainted with phrenology, but who are in reality ignorant of the subject except, it may be, through a mere superficial acquaintance with phrenological busts sold in various shops. Take one of the latest writers, Dr. Bastian. One of the several reasons why Dr. Bastian dismisses phrenology is that "the grey matter of the convolutions —the matter which we now believe to be so largely concerned with the most delicate and subtle of brain-functions — was, by the founders of phrenology, considered to have *no* proper nerve function at all." The founder of phrenology was admittedly famous as an anatomist, and nothing can show the fallacy of Dr. Bastian's assertion clearer than George Henry Lewes's exactly opposite statement (*The History of Philosophy*, vol. ii., p. 447) that "the basis of phrenology rests on four positions: 1. That the *grey* matter of the convolutions is the organic substance of all psychical actions. 2. That no other part of the nervous system has any essential connection with the mind. 3. That each distinct faculty has its distinct organ. 4. That each organ is a limited area of grey matter." One must fain be sorry that Dr. Bastian has not deemed it expedient to lend greater attention to phrenology. His statement makes it manifest that opponents agree only in a single point, that, namely, of discrediting Gall's doctrine, but they differ at large from each other in their statements as to what the doctrine really does teach.

His second assertion against phrenologists is "that their analysis of the human mind was supposed to have been complete." It is a pity Dr. Bastian should dis-

play such entire lack of caution in his statements, but probably he did not expect there would ever be any one to reply to him. If Gall had first analysed mind and then searched for the centres of each fundamental faculty, the analysis at least might have been complete. But Gall did nothing of the kind. He studied first and foremost the physiology, that is, the functions, of the brain. That there was a certain harmony in the arrangement of the faculties only shows that he was probably correct in his observations, but it was not his doing. Now, Gall did neither discover all the functions of the brain, nor did he formulate all the fundamental faculties. He says :

"But I am far from believing that the edifice is finished. Neither the life, nor the fortune of one man, could suffice for such a vast investigation. I have had to depend on my own resources. It will require many fortunes to bring this study to the perfection which my unaided efforts could not alone effect. . . . I do not as yet know the functions of all the cerebral parts ; consequently further discoveries have yet to be made. I have also more than once avowed that it is impossible for me to circumscribe exactly the extent of each centre, and have urged this consideration upon those who believed that in removing such or such parts of the brain they would be enabled to learn its function."

But Dr. Bastian may urge that the later phrenologists claimed completeness for their system. Well, here is one of the most distinguished converts of the last half of the century, a theologian and philosopher, the Rev. Henry Ward Beecher, who said :

"All my life long I have been in the habit of using phrenology as that which solves the practical phenomena of life. *Not that I regard the system as a completed*

one, but that I regard it as far more useful, and far more practical and sensible than any other system of mental philosophy which has yet been evolved."

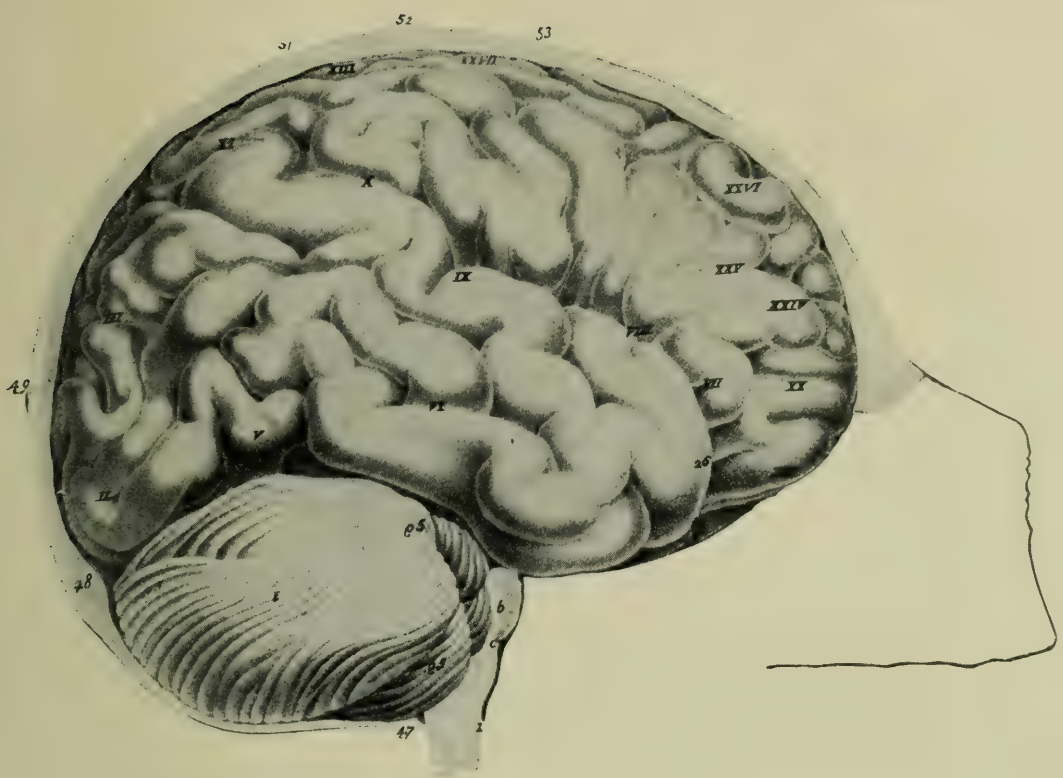
Dr. Bastian's third statement against the doctrine rests also on an erroneous basis. He says (*The Brain as an Organ of Mind*, p. 519): "If we take the organ of philoprogenitiveness, for instance, whose assigned situation at the back of the head may be seen in any phrenological bust, we find that it corresponds with a bony prominence, which varies greatly in thickness in different individuals; whilst internally it corresponds to the point of union of four great venous sinuses, and within these as much to the tips of the occipital lobes as to a part of the upper and posterior border of the cerebellum."

Dr. Bastian evidently denies to the phrenologist any anatomical knowledge, because the busts which are sold in various shops are not marked with the prominences of the skull. Had he looked at Combe's *System of Phrenology* he would have found (p. 75) that phrenologists are acquainted with the situation of the occipital protuberance, and place philoprogenitiveness in the occipital convolutions.

As I have maintained that no one has ever recurred to Gall's own works, why should Dr. Bastian be deemed to be the solitary exception? At the same time no terms could be sufficiently condemnatory for the spreading of such an error as that the founders of phrenology considered the grey matter of the brain to have no proper nerve function at all. Whence did the eminent scientist draw his information?

As regards the situation of the so-called "philoprogenitiveness" in a bony protuberance, Gall explains definitely that each organ is double, one in each hemi-

PLATE XXIII.



From Gall's Atlas, 1809 (*reduced*).

SIDE-VIEW OF BRAIN.

48 Occipital protuberance.

II "Attachment to offspring," or "Philoprogenitiveness."

Dr. Bastian (see p. 418) declares that phrenologists place "Philoprogenitiveness" in the occipital protuberance, and thus accuses the founders of phrenology of having been ignorant of anatomy. The above illustration, taken from Gall's works, proves Dr. Bastian's *unscientific* proceeding, and the worthlessness of his criticism.

sphere. Dr. Gall was the author of the article on the "Cranium" in the *Dictionnaire des Sciences Médicales*, and himself drew attention to the irregularities of the skull, as I show in the chapter on the "Relations between Brain and Skull." Let Dr. Bastian take the following words of Dr. Gall's to heart:

"A critic, who, in order to combat his adversary, is obliged to attribute to him opinions contrary to those which he professes, betrays the weakness of his own arguments. By what right do those anatomists suggest the idea that men, who for a long series of years have devoted themselves to the study of the functions of the brain, with an indefatigable zeal and a love of truth overcoming all obstacles, have neglected to observe so necessary a condition?"

Elsewhere Gall says: "But I still repeat that we ought always to bear in mind that only those developments of the cranium which are caused by the subjacent cerebral substance possess any relation with organology."

Such misrepresentations as the one quoted are allowed to be spread, but woe betide the man who dares to contradict them, who ventures even to suggest that so great a man may be liable to error, that he may have been prompted by his feelings and impelled by the general animosity that prevails against Gall and phrenology rather than by his own reason!

Dr. Bastian concludes his criticism of phrenology by stating that "it would have been almost needless, indeed, to have dwelt so long upon this subject but for the fact that amongst the general public there are probably very many who, if not actual believers in the 'phrenology' of Gall and Spurzheim, may be glad to know upon what precise grounds the system should be rejected."

It would have been almost needless, indeed, to have dwelt so long upon Dr. Bastian's criticism of phrenology but for the fact that amongst the general public there are probably very many who, knowing Dr. Bastian as an eminent authority on the brain, may have their doubts as to his knowledge of phrenology, and hence be glad to know upon what precise grounds his criticism should be scattered to the winds.

4. A Popular Lecturer on Phrenology

Dr. Andrew Wilson, though he allows himself to be mentioned in the Pears' Soap advertisements as Lecturer on Health to the "George Combe Trust,"[1] seizes every opportunity he can, in his lectures, books, contributions to magazines and weekly journals, to belittle phrenology. As a popular writer many people will assume that he fully knows the subject about which he writes, and hence will believe that his verdict on phrenology is a just one. The very first sentence taken from Dr. Wilson's criticism will convince every reader of the worthlessness of this gentleman's opinion. As "George Combe Lecturer" we must suppose that Dr. Wilson knows who George Combe was, and we might expect him to have read the work of the most popular expounder of phrenology. Mayhap he has, but he is not bent on criticising Combe's phrenology, nor any other man's phrenology, but the phrenology as represented on toy busts, for he says: "The fundamental doctrine of phrenology is well known to most of us. Its great doctrine is pictorially illustrated in the heads

[1] These lectures are intended to spread a knowledge of those natural laws which secure health of *mind* as well as body. "Health of mind," according to George Combe, who endowed these lectures, is obtainable only by a careful study of what he considered the only true physiology of the brain, *i. e.*, "phrenology."

of opticians' windows." I should very much like to borrow some words from the vocabulary of antiphrenologists to express my opinion of such a misrepresentation. But there is worse to come.

Dr. Wilson admits that some professional phrenologists do succeed in reading character, but he asks: "How does the phrenological professor succeed very fairly in reading character?" (Note the admission!) Which he answers thus: "His guide to character is in reality the face, not the brainpan." Now here is a downright misstatement. According to Dr. Wilson physiognomy is a true science, not so phrenology; the phrenologist deceives the public,—he reads the face. I can vouch for the fact that the chief phrenologists in this country do not believe in physiognomy, and that most of them are totally ignorant of it. I have seen most of the experienced men read heads, on some occasions even blindfolded; I have seen them tested by reading the skulls of men and women whose character was known to the collector, not to speak of my own capacity in the same direction,—yet I have never given a moment's study to physiognomy,—and I can affirm that a qualified phrenologist reads the head, and the head only. Probably Dr. Wilson had some individual case in his mind. This only shows the recklessness of his statements. Frederick Bly, a professional phrenologist of Cincinnati, was a blind man, and hence could not have read the face. He estimated the shape of the head by the sense of touch alone.

Dr. Wilson next tells us: "Were the deductions of phrenology true, or were its claims to be regarded as a science founded on definite grounds, mind could no longer be regarded as a mystery, since it would be within the power of the phrenologist to assert that

when swayed by emotions of one kind or another he could declare which part of the brain was being affected. This declaration logically follows upon that which maintains the localisation of faculties in different parts of the brain; but it is a conclusion at the same time from which physiology simply retires in outspoken disdain as presenting us with an empirical explanation of mysteries to which the furthest science has yet failed to attain."

No doubt the mind is still a mystery to the physiologists and alienists; it would not be so had they treated Gall fairly. It took the investigators of brain-functions sixty years to *re*discover the speech-centre that had been discovered by Gall; it took them a hundred years to *re*discover the probable brain area for music, and now I am demonstrating what investigators ought to have known in Gall's time, that "morbid fear and melancholia" are due to a circumscribed disease of the brain; that "irascibility and violent mania" are the outcome of a morbid condition of another particular part, that "suspicion and ideas of persecution" have their origin in another special locality, and so on. Mind will remain a mystery to brain-investigators so long as misrepresentation, libel, and slander are the instruments with which new discoveries are to be combated. So long as a certain type of men content themselves with looking at models in opticians' windows for enlightenment about Gall's doctrine, so long will they remain ignorant of the science of mind. The pity of it is that, albeit ignorant of even a line of the great discoverer's own writings, they set themselves up as authorities to, forsooth, pass judgment on his doctrine, and are accepted by the public as being competent as such, simply because of their lofty position.

Dr. Wilson further says: "The phrenological doctrine of the disposition of the faculties must be held to include the idea that, the larger the brain, the better specialised should be the mental faculties of the individual; the greater the amount of brain substance, forming the good and bad qualities and regions of the phrenologists, the more active should be the mental organisation. Now, it is a patent fact that this rule tells strongly against the phrenologists' assumption. True, various great men have had large brains, but cases of great men possessing small brains are equally common, as also are instances where insanity and idiocy were associated with brains of large size."

To use such an argument *against* phrenology is perfectly ridiculous, for without the help afforded by phrenology the fact mentioned could not be explained. As has been shown in the first chapter of this work, small heads may prove clever when the principal brain mass lies in the frontal lobes; a large head may be dull and stupid when the principal brain mass lies in the parietal, temporal, or occipital lobes. The author of this argument has not mastered even the elementary principles of phrenology—and this was a "Combe Lecturer!" Then he enlarges upon the good and bad faculties of the brain, whereas phrenologists have always taught that all faculties are good if in right proportion; it is their abuse only that can be regarded as bad. What do medical psychologists say to Dr. Wilson's knowledge of insanity? It will be news to them that insanity is confined to small brains. Dr. Wilson knows where it was associated with brains of large size. What a curious notion of the pathology of this disease! Dr. Andrew Combe's *Mental Derangements* and Dr. Spurzheim's *Insanity* might well be

recommended to Dr. Wilson's perusal. His colleague, Dr. Maudsley, albeit an antiphrenologist, does make favourable quotations from the latter work.

I am glad to happen upon a passage in Dr. Wilson's criticism with which I am able to agree. He very justly observes: "The *scalpel* of the anatomist can nowhere discover in the full-grown brain an organ of 'veneration,' or of 'hope,' or of 'language,' or of 'destructiveness,' or of any other mental feature; nor can his *microscope* detect in Nature's wondrous process of fashioning the brain any reason for the belief that the organ of the mind is a collection of parts, each devoted to the 'exercise of a special quality of mind.'"

This is very prettily put by Dr. Wilson, and is perfectly true. Anatomists would never have discovered an organ of language in the brain had not Gall shown them the way and recorded so many cases of aphasia. It is the clinicist and pathologist who must assist in these discoveries. In this work I confirm the localization of the faculties mentioned by Dr. Wilson, "veneration," "hope," and "destructiveness," from my own clinical and pathological experience. I do not approve of the terms Spurzheim has assigned to these faculties, but no one contended they were final, and neither Professor Bain, nor Herbert Spencer, who both studied phrenology, has succeeded in substituting better terms. If only the localisation prove correct, our vocabulary will be enlarged in course of time so as to include the really fundamental faculties of the mind.

Were I aided by every instrument modern science can supply, I might still detect nothing in the appearance of either the optic, auditory, olfactory, or glosso-pharyngeal nerves to define their respective

function. The anatomist may cut into the brain and study its structure, but anything further than this lies quite beyond his art. Even the physiologist, shut up in his laboratory, will not discover human faculties, although he may make out certain physical functions which are demonstrable in the lower creation.

To show how much even a scientific investigator may be influenced by his mental bent, is illustrated by the following fact: Phrenologists had for half a century maintained that different parts of the cortex had different functions to perform. This was, by men who studied the naked eye and microscopical anatomy, denied, on the ground that there was no difference in structure of the several parts. However, when the discovery of the motor centres in the central convolutions of the brain proved the axiom of the phrenologists to be correct, these same individuals were not long in finding that this central area was in its minute structure different from the rest of the brain.

Dr. Wilson states: "There is no division into separate parts and portions, as the phrenologists' charts would lead the observer to suppose. The arrangement which appears so clear on the phrenologists' bust is nowhere represented in the brain itself."

Apart from the fact that Gall had located his centres in the brain and indicated them by numbers and not outlines, Dr. Wilson's argument might with equal force be advanced against the localisation of the motor and sensory centres of the present day. But why should Dr. Wilson read a phrenological text-book? It is much more amusing to listen to some phrenological showman at the "Royal Aquarium" or on the sands at some sea-side resort, and if you spend sixpence to have your head read, you will get a chart which will give

you all information about phrenology to enable you to pose as an authority about it, and without dipping into the ponderous and such terribly technical volumes of Gall, which are not obtainable now under less than a ten-pound note.

Dr. Wilson says: "Moreover, one very important consideration will dawn upon the reflective mind which considers that the convolutions of the brain are not limited to the crown and sides of the head, but, on the contrary, extend over the entire surface of the cerebrum, and are developed on its base. No phrenologist has attempted, it is true, to get at the base of the brain by inspecting the palate; but it would be regarded as an absurd and unwarrantable statement to assert that the base of the brain has no functions, and that the mind of man is located only at the top and the sides of the head. Yet the phrenologist is in the position of one making such an assertion, since his science takes no account of the base or internal parts of the brain — situations forsooth, in which anatomy and the newer phrenology demonstrate the existence of very important sensory and other organs."

All this would, of course, naturally suggest itself to one whose knowledge of phrenology and what it teaches of the functions of the brain had been derived from a brief glance at a phrenological head in the optician's window. Had the learned doctor ever opened Gall's works and looked at his drawings of the brain, he would have found figures indicating centres at the base and at the sides of the brain. In fact all, the perceptive centres which Gall is accused of having located in the frontal sinus are actually situated in the supraorbital convolutions, and the organs of "firmness" (leg-centre), "veneration," etc., in the convolutions

bordering on the middle line, extend down to the sides.

Dr. Wilson further states that "in so far as comparative anatomy is concerned, phrenology receives no assistance in the attempt to localise mind-functions in man," and "the bump of destructiveness in the feline races resolves itself into a mass of jaw-muscles, and the elephant's brain is placed certainly not within a foot or so of the most skilful of phrenological digits."

Such statements are nothing more than mere outbursts, for Gall has shown the differences in brain structure from the lowest to the highest animal. Cuvier—whose fame rests entirely on his researches in comparative anatomy, and who was opposed to Gall—did not advance a single argument against Gall's doctrine taken from his own science. Vimont, who spent £3000 in the production of a work on Comparative Anatomy which was to disprove phrenology, became, from the study of his own collection of specimens, a convert to Gall, and published a work which is one of the monuments to phrenology, drawn entirely from a comparison of the brains of all animals.

It is evident that Dr. Wilson has not studied phrenology. He knows nothing whatever of the systematic expositions of the doctrine. What he criticises is a disjointed and feeble fabrication of his own contrivance with intent to prejudice phrenology, and when he has —as he deems—demolished this fabric of misrepresentation, he rejoices and proclaims "victory!"

5. Mental Science as taught by a London Physician, an M.D. (gold-medallist.)

While there are many phrenologists who are ignorant

of the structure of the brain and without any scientific training, it would be difficult to find one displaying so much ignorance in mental science as a recent lecturer, a London physician, an M.D. (gold-medallist), has exhibited, according to the printed report before me, dated 2d May, 1900.

1. "The lecturer pointed out that there have been cases where whole portions of the brain have been removed, and yet the health and general behaviour of the person so operated upon has been quite unaltered thereby." This is the old fairy tale disposed of in Chapter I.

2. "A West Indian negro's head excelled in size the head of Mr. Gladstone, and *according to Phrenology* should be one containing a vast intellect."

There is *no* originality in these antiphrenologists, but if the lecturer had said *according to the modern physiologists* he would have been correct. Modern physiologists assert that the size of the brain is an index to the *intellectual* power of man, whereas phrenologists have pointed out for a century that the size is an index to the intellect, feeling, and animal propensities taken together. A negro may have a large head, but if the preponderance be in width across the temporal regions, he will show a greater manifestation of animal propensities, and not of reasoning power.

3. "The skull would rather tend to form the shape of the brain than the converse." A medical student making such a statement at his first anatomy examination would be likely to be plucked, yet here have we an M.D. (gold-medallist) teaching the public such arrant nonsense.

4. "Some time ago, the lecturer said, he had been examining the brain of a man, and had remarked from

the shape of the brain that the man had been left-handed for some few years. Upon due inquiry it turned out that the said man's right arm had been amputated some three or four years previous to his death."

This is another fairy tale, which may be told with impunity to a lay audience; but the discoverer of the arm-centre must be smiling in his study when he reads this, and regret that nature had not endowed him with such very keen sight. Are not the "bumps and depressions" of phrenologists being ridiculed? But if the amputation of an arm causes a depression on the surface of the brain after a few years, then the phrenological theory of "atrophy and hypertrophy" would, after all, be correct.

5. "It was just as reasonable to determine a person's digestive capacity by looking at his waistcoat as it was to pretend to know the shape and condition of the brain by feeling the skull. The brain being but a soft mass —it was no thicker than porridge—could not possibly affect such a hard, bony substance as the skull."

The lecturer was able to see a depressed arm-centre in that porridge of his, but he had never noticed the great varieties in the shape of heads. "That the brain cannot affect the skull" is in contradiction to all the learned anatomists who have been quoted in a previous chapter.

6. "A well-developed biceps might lead to combativeness, and a lack of agility to caution, but these qualities were not brain-faculties."

The lecturer has evidently never seen a little boy attack a big boy, or a tiny, feeble dog a ferocious large beast. Nor has he read Lord Wolseley's "Essay on Courage and the Fighting Capacity amongst Soldiers." Physicians, as a rule, acquire an extraordinary knowledge

of human nature, but it seems that the laboratory work of the present day, if the lecturer be a true example, destroys this capacity for general observation, for which physicians of the past were so famous.

7. "Again, he did not believe that the cerebellum had anything to do with philoprogenitiveness, even though it were more prominent in woman than in man."

It is customary, before launching out into criticism, to acquaint one's self with the subject to be criticised, but our lecturer locates "philoprogenitiveness" in the cerebellum instead of the "amative propensity."

8. "The lecturer said that if Gall did locate the organ of language, he did not prove that it was such. The only explanation he could offer for Gall's having found this organ was that Gall made a happy guess."

This amounts to a piece of sheer impudence. However, it does reflect credit on Gall's divining power. What a wonderful man he must have been to have guessed almost the entire anatomy of the brain, including the origin of the different cranial nerves, the course of the motor fibres, etc.

9. "Dr. Ferrier's discoveries had saved thousands of lives. (Hear, hear.)"

This will be pleasant news to the eminent specialist, but it is rather unfortunate that Hitzig, Ferrier, Bergmann, Keen, and other authorities in this department, should have published statistics by no means favourable, and have even cautioned surgeons not to operate too hastily.

Such is the result of mere laboratory training. It disqualifies many a general physician. It creates experts in physical and microscopical science, and enables the physician to see diseases, but not the man who suffers from them.

6. Hitzig, Flechsig, Meynert, etc., on Phrenology

The opponents of Gall made use of his name whenever they could in connection with ideas which they fancied they could refute, and generally along with every fact that looked unfavourable to Gall's opinion, but they always forgot to cite him in relation to the discoveries of which they approved.

Johannes Müller, a contemporary of Gall, was the first physiologist to utilise Gall's doctrine and cover up the fact by denouncing him. He wrote:

"In no part of Physiology can we derive greater aid from Comparative Anatomy than in the physiology of the brain. Corresponding with the development of the intellectual faculties in the different classes, we meet with very great differences in the form of the brain, which are highly important in aiding us to determine the functions of the different parts of the organ. . . . The brain undergoes a gradual increase of size from fishes up to man, in accordance with the development of the intellectual faculties. All parts of the encephalon, however, do not keep pace equally with the development of the intellectual powers. It is in the cerebral hemispheres that the increase of size in the higher animals chiefly takes place."

Compare Müller's statement with the passage in the *Edinburgh Review*:

"We deny that there is any connection or proportion whatever to be observed, on a comparison of animals with each other, between their intellect or inclinations and the number of parts in their brains."

One of the men who has done most to establish the doctrine of the plurality of functions of the brain is Professor Hitzig of Halle, the discoverer of the motor centres in the brain. Yet listen how he gets

himself out of the difficulty of having to acknowledge his own contribution to phrenology. He confesses that he cannot speak from his own experiences, but he rejects Gall's doctrine, because "Leuret *is said* to have demonstrated as a consequence of Gall's own statements that the rabbit would have to be a more destructive animal than the wolf, and the donkey immensely more musical than the nightingale."

And this is another man who is supposed to have demolished phrenology.

Hitzig's example is followed by FLECHSIG.

Professor Flechsig (*Gehirn und Seele*, Leipsic, 1896) practically adopts phrenology. All the fault he can find is the terminology of organs, such as "friendship," "benevolence," "wit," "firmness," etc. Yet farther on, page 29, he speaks of the "amative propensity," of the "feeling of hunger and thirst," of the "emotion of fear," which give impulses awakening memories connected with them as if by a magic rod.

P. 31.—Besides these propensities giving impulses, there are inhibitive feelings (the moral sentiments) so that these animal impulses may be eminently moral. When alcohol or disease affects the inhibitory centres of the intellect or the moral sentiments, then the low propensities, "anger," "rage," and "fear" manifest themselves prominently.

A healthy frontal association centre is necessary for the control of the sensual impulses.

Speaking of "moral insanity" (p. 32), he says a special characteristic of it is, besides the total absence of the social instincts, of "attachment" and "sympathy," an increased activity of the propensities. Just the same as in lesion of the intellectual association

centre, such persons react easily and immoderately to slight stimulation of the propensities.

P. 92, he says: The "inanition" psychoses are due partly to transitory inhibition and excitation of larger or smaller areas of the cortex. He locates in the motor area the emotion of fear, obsessions, imperative ideas and acts.

First Flechsig distinguished nine territories; in the second edition of his book only seven.

He claims, like Gall, for each centre the general attributes of memory, judgment, etc.

P. 102.—There occurs yet another paragraph from Gall:

"Genius depends not on degeneration but on a progression, that is, *an abnormally large development of a circumscribed brain area* as compared with the rest."

Flechsig has done like Maudsley, Herbert Spencer, Meynert, and others: he has assimilated what he found suitable in Gall's doctrine, which amounts to everything save the detailed localisation. At this he sneered and thus hid the fact that the basis of his own teaching is identical with the doctrine taught by Gall, Spurzheim, and Combe, about which modern readers are profoundly ignorant. He even adopts the "bump" theory. (See the above quotation about "Genius" and his remarks on the skulls of Bach and Beethoven, Chapter II.)

While Flechsig would in no wise acknowledge his indebtedness to Gall, yet he does contend that Meynert ought to be grateful because Gall's careful anatomical investigations had prepared the way for Meynert's work. Professor Meynert not only adopted Gall's physiology, but also his anatomical discoveries for his own use. No investigator has ever carried out

Gall's instructions so faithfully. Yet what was my surprise on reading, instead of an acknowledgment, the following:

"Much more hopeful can we be to get some day to understand the functions of the brain, which must of necessity lead to the creation of an organology of the brain-surface. We need not be afraid of it, because of Gall's *swindle*, for if two engage upon the same thing it need not turn out the same, especially when we recognise the *frivolous ambition* of the man, who, according to Burdach's striking characterisation, 'did not want to be within the bond of science, or a link in its chain, but wanted solely to float on the surface,' as compared with our own exact, careful, scientific, psychological method."—(*Vierteljahrschrift für Psychiatrie*, Leipsic, 1867, p. 77.)

This reckless statement is enunciated by a man who made his reputation by elaborating the principles and carrying out certain of the details of the founder of brain-physiology, whom he dares to call a "swindler" carried away by his ambition.

It is not necessary to waste many words on such a man. Let readers look at the chapter on anatomical and physiological discoveries of Gall, or, better still, look into Gall's own work, and judge for themselves.

This is what the man with the "frivolous ambition" wrote, who "wanted to float on the surface." Gall says: "I have never wished to be talked about. Whenever anyone will convince me of the falsity of my discoveries, I shall be the first to announce it to the public. *Truth is my object.* I place it above all personal considerations. *May all my adversaries follow my example!*" Elsewhere Gall says: "I regret, and always have regretted, that I dare not flatter myself

that my undertaking will ever be continued in all its details, or that my exertions will get appreciated. Whoever is not impelled by an innate instinct of observation; whoever finds it hard to sacrifice his opinions, and the views he has derived from his earlier studies; whoever thinks more of making his fortune than of exploring the treasures of nature; whoever is not fortified by inexhaustible patience against the interpretations of envy, jealousy, hypocrisy, ignorance, apathy, and indifference; whoever thinks too highly of the force and correctness of his reasoning to submit it to the test of experience, a thousand times repeated, will never do much towards perfecting the physiology of the brain. Yet these are the only means by which my discoveries can be verified, corrected, or refuted."

Who is any longer in doubt as to the libel which Meynert committed? Yet our adversaries will continue to say: Meynert was an honourable man; Gall was a swindler.

Meynert, and many others of his stamp, may have achieved a temporary success by their supposed "discoveries," but their libellous utterances against Gall show that they were or are not in the habit of thinking and examining for themselves, but that they rather "adopt" the conclusions of others.

I hope that I have shown enough to convince the reader that the reception and subsequent treatment of Gall's discoveries for a whole century is one of the most unworthy and regrettable in the whole history of modern science.

In France we rarely read of an attack on Gall. The school of Comte has done very much to establish Gall's reputation there. Indeed, a German antiphrenologist, Dr. P. Näcke of Hubertusberg,—a man who regarded

the cortex as a *tabula rasa*,—regrets very much *the phrenological tendencies of French writers*, and gives quotations from Charcot, Magnan, Dubisson, Gilles de la Tourette, Féré, Lacassagne, Laurent, Bordier, Manouvrier, Corre, Richet, De Bayer, Duret, and Grasset in support of his statement.

Phrenology is not yet dead, and if it be doomed to extinction the work must be effected by other contrivances. *Misrepresentation, denunciation, and all the shuffling devices of unfairness on the part of its adversaries have had their day*, but have failed to achieve their assumed task. These expedients must now cease, and observation, inquiry, and argument enter the field. By such means alone can truth be elicited, to whatever side of the controversy it may incline. Let opponents study Gall's works, and then state frankly their objections to his doctrine, *as expounded by him*, but not as put forth by its antagonists and those who are ignorant of it. Let critics make their statement gravely and courteously like philosophers and men of breeding, not rudely and sneeringly, like coarse jesters and cheapjacks in the field of science.

7. Napoleon and Gall

Dr. Antommarchi (*Memoires du docteur F. Antommarchi*, vol. ii.), the body physician to Napoleon, did much to ruin Gall in Paris, just as Dr. Stifft, physician to Francis I. of Austria, contrived to render Gall's stay in Vienna impossible. How very differently Sir James Clark, physician to Queen Victoria, has acted when introducing George Combe and phrenology to her late Majesty.

"Lady Holland had sent a box of books, in which

was also contained a bust in plaster, the head of which was covered with divisions and figures according to the craniological system of Dr. Gall. 'There, doctor,' said Napoleon, 'that comes within your province; take and study it, and you shall then give me an account thereof. I should be glad to know what Gall would say of me if he felt my head!' I immediately set to work, but the divisions were inexact and the figures misplaced, and I had not been able to put them to rights when Napoleon sent for me. I went, and found him in the midst of a mass of scattered volumes, reading Polybius. He said nothing to me at first, and continued to run over the pages of the work he held in his hand; he then threw it down, came to me, and taking me by the ears, and looking me steadily in the face,—'Well! *do Horaccio di capo corso*, you have seen the bust?' 'Yes, sire.' 'Meditated the system of Gall?' 'Very nearly.' 'Comprehended it?' 'I think so.' 'You are able to give an account of it?' 'Your Majesty shall judge.' 'To know my tastes and to appreciate my faculties by examining my head?' 'Even without touching it.' (He began to laugh.) 'You are quite up to it?' 'Yes, sire.' 'Very well, we shall talk about it when we have nothing better to do. It is a last expedient and just as good as any other, but it is sometimes amusing to notice to what extent folly may be carried.'"

Then follows a monologue of Napoleon, which culminates in one expression,—"Nature does not reveal herself by external shapes."

Previously the following appeared in Napoleon's *Memorial de Sainte Hélène*, by Count Las Casas: "I have frequently contributed to put down Gall. . . . Nature is not so poor, even were she rude enough, to

announce her meaning by external forms—we should soon attain our ends and should be more learned. . . . What would become of the bump of thieving if there was no property? of the bump of drunkenness if no fermented liquors existed? or that of ambition, if man did not live in society?"

What would become of our eyes were there no light? But light does exist. What would become of taste and smell, were there no odorous particles and no savoury qualities? Yet these qualities and particles do exist. What would become of the propensity to propagation, were there not two sexes? But two sexes do exist. In like manner, property and society exist in nature. Verily Dr. Antommarchi's modesty must have been very great and his understanding gigantic in dimensions, if he could study, comprehend, and master in a few hours a system that had taken some men years to grasp and to apply. Dr. Antommarchi had but a scant and superficial knowledge of the physiology of the brain, and was not at all prepared to rectify the prejudices of his august patient. That mischievous plaything, a phrenological bust, was sent to amuse, but why not Gall's own works? Had Antommarchi been, like Corvisart, a partisan of Gall, Napoleon would not have put him down as he did. As it was, while in Paris, he scolded sharply those members of the French Institute who had shown themselves enthusiastic about Gall's novel demonstrations. Thus was the thunder of Jupiter launched against the pigmies. Straightway Gall's discoveries were nought but "reveries," "charlatanism," and "absurdities," and the journals were used as instruments for throwing ridicule—an all-powerful weapon in France—on his doctrines. As a proof of this, it may

be mentioned that from that moment Cuvier, the celebrated naturalist, who had previously upheld Gall, abstained from doing so after this, in public at least, though he remained on friendly terms with him until his death.

CHAPTER XI

AUGUSTE COMTE'S POSITIVE PSYCHOLOGY BASED ON GALL'S DOCTRINE

CHAPTER XI

AUGUSTE COMTE'S POSITIVE PSYCHOLOGY

AUGUSTE COMTE, the eminent French philosopher, is the originator of the law that each branch of knowledge passes through three states: the theological, metaphysical, and the scientific or positive state. In no case could he apply this law more successfully than to that of "Physiology." Gall has given him all the material to do so. His work on *The Brain and Nervous System* revolutionised our knowledge of physiology and laid the foundation to a positive psychology. Gall, from his point of view, and from the position he held, was justified, or at all events had good grounds, to oppose metaphysics. But Comte, although, as we shall see, he joined in the opposition, was less justified, inasmuch as he did not follow Gall's inductive method, but indulged in speculations which were anything but "positive."

Comte, from the outset, acknowledges Gall as his authority, and gives him credit for his efforts to make psychology a cerebral science.

"In entering on this great subject, I find it specially incumbent to render due justice to my principal guide. From the first origin of true biological science Gall attempted to bring the higher and more difficult prob-

lems within its range, and thus effectually to shatter the last link which chained natural philosophy to metaphysical and theological systems. And this bold project he realised to a degree beyond all that the most competent thinkers of his time had imagined possible. In a time when the attributes of human nature were narrowed down by all existing schools to mere intelligence, Gall boldly upheld in his own way the positive doctrine of the preponderance of the heart over the intellect, a truth indicated by the common instinct of mankind, but unknown as yet to science. He dissipated, on the one hand, the nebulous mental unity of psychologists and ideologists, by demonstrating the plurality of intellectual and moral organs. And, on the other hand, here moved the old biological error of attributing the higher functions to any but the cerebral apparatus. To appreciate the importance and the difficulty of this latter service we must remember that the passions were still referred to the vegetative viscera, not merely by Bichat, who never had the time to examine the subject with sufficient care, but even by Cabanis, who devoted such attention to it. At a time when naturalists by common consent were devoting their whole attention to dead animals, Gall took living actions, which he observed so admirably, as the foundation of his principal analysis of propensities and faculties."

But while Comte renders due justice to the philosophical part of Gall's work, he undervalues his physiological discoveries, forgetting that Gall was first collecting his facts regarding the connection between the organic state of parts of the brain and certain fundamental faculties, and then drawing his deductions from them. Comte accepts the deductions only, and

pays no attention to the facts. He is under the impression that Gall first analysed the human faculties and then tried to discover their connection with the brain. Furthermore, Comte, like Gall's English followers, invested his doctrine with the appearance of a complete system, instead of proceeding on Gall's scientific basis, and ensuring primarily the foundation of the work. These philosophical additions balked the entire doctrine and have justified Herbert Spencer's criticisms. Comte laboured under the curious misapprehension that Gall's collection of physiological and pathological facts was merely a didactic artifice to justify his analysis of the human faculties. Gall did not, in fact, pretend to have discovered or enumerated all the faculties. "Probably," he says, "those who follow me in the career which I have opened will discover some fundamental forces and some brain-organs which have escaped my researches." He avows, furthermore, his inability to indicate in all cases the fundamental forces; even those which he deemed fundamental he admits may be found to be complex. "I know," says Gall, "it would have been more philosophical to refer always to their fundamental forces the qualities or faculties which I could detect only in their highest action; but I preferred leaving something to do for those who came after me, rather than afford them an opportunity to disprove what I had prematurely advanced."

Comte strives to discover the fundamental faculties by a study of the human progress as a whole, that is "Sociology." By a process of speculative reasoning he arrived at an analysis of human faculties. He altered the classification ten times in three years, which makes one doubtful as to its positive foundation. But what may we think of the founder of "positive philosophy,"

when he proceeds by the same method of abstract reasoning to localise the various faculties in different parts of the brain, without producing a single fact in support of his localisations? What is there to distinguish him from the metaphysicians whom he overhauls at such great length?

According to Comte, Gall's system was a failure because constructed without the intermediary of Sociology; but his imperfect results afforded free scope to proceed at once to the universal science, for which this was the only preparatory step still lacking.

"As the founder of Sociology," he observes, "I owed this special acknowledgment to the biologist who has done more than any other to free my philosophy from every trace of Ontology as well as Theology."

Physiology and Pathology he thinks incompetent to solve the problem of localisation of function.

Gall observed, and it is an acquisition of science in the present day, that the anterior part of the brain is connected with the intellect, the middle part with the moral faculties, where we might suppose them on other grounds because of their connection with the principal mechanism of motion, and the posterior part and sides with the propensities. This principal division is accepted by Comte, only under different designations.

He represents the brain as appropriated to three orders of functions, the preponderating portion of it, and more especially the posterior region, being given to Feeling; the anterior portion to Intellect; the central portion to Activity. The feelings, again, are divided into two classes,—the personal and the social.

So far there is no serious difference between Gall and Comte. Even the arrangement of the faculties Comte intended to carry out after what he calls the

"idea" of Gall, but which was in reality an "observation" made by Gall, that the functions of the brain are so arranged that their succession presents a developed series, being higher in quality and inferior in force according as we proceed from back to front. Comte thus appropriates the anterior extremity of the affective region to the social feelings, reserving the larger portion to the personal instincts; the hinder portion always belonging to the less noble propensity. The benevolent inclinations are placed in proximity to the intellectual organs.

We now take leave of Gall to follow Comte in his original speculations. We have had hitherto four groups of faculties:

1. Personal instincts } forming together the "Heart."
2. Social instincts }
3. The Intellect (Counsel).
4. The Character (Execution).

Comte divides:

1. The Personal Instincts into { (*a*) The Instinct of Preservation. (*b*) The Instinct of Improvement.

The Instinct of Preservation he divides into:

(*a*) The preservation of the individual, and
(*b*) The preservation of the race.

The *nutritive instinct* leads to the preservation of the individual; it is a strictly universal instinct, no animal supporting life without it. Even in the human race this instinct, which includes all that relates directly to the material preservation of the individual, is the foundation on which all the others are raised. "There can

be little doubt," says Comte, "as to where this instinct should be placed. The nutritive instinct should occupy the lowest position in the brain, as near as possible to the motor apparatus, and to the vegetative viscera. I would place it, therefore, in the median portion of the cerebellum, leaving the remainder of this large region to the reproductive instinct."

By such a process of reasoning as Comte here applies, the most difficult problems that science has to deal with could be disposed of within a short space of time. And this method of discovering the functions of the brain is called "positive."

We now come to the preservation of the race. Here we have two instincts,—the *sexual* and the *maternal*, *i. e.*, care for the offspring.

Succeeding to the series of preservative instincts we have two of a more elevated and universal kind,—the instincts of improvement. Comte names them the *military* and the *industrial* instincts.

"Higher and less energetic than the preservative instincts they are more directly concerned with the animal functions, whereas the former are principally concerned with vegetable life. They belong, nevertheless, like those, to the egoistic division; since in stimulating the animal to ameliorate his condition they appeal only to self-gratification. Such amelioration may be attained by either of two ways, which often co-exist,—by the destruction of obstacles or by the construction of instruments."

Comte places the military behind the industrial instinct in the posterior cerebral region. Needless to say that experimental physiology can throw no light on such complex functions.

We have to consider two intermediate affections

before leaving the five egoistic instincts and analysing the social faculties. These are :

(*a*) *Pride*, or the Love of Power, and

(*b*) *Vanity*, or the Love of Approbation.

Both are essentially personal yet spring from the relations of the individual to his fellow-beings, and thus the means through which these instincts are gratified give them a social character. Pride aims at personal ascendency by force, Vanity by opinion ; the one seeks positions of command, the other the consultative influence of conviction or persuasion. Regarding the situation of these intermediate propensities Comte says, " the more personal of the two should be placed below the other; that is to say, by the side of the industrial organ ; the other and more social being situated above that organ." Comte evidently had a high idea of the artistic designs of nature, for he arranges his localisations to please both the eye and the understanding. Thus the larger of the two affective regions ends as it begins with an organ occupying a central position. This completes the series of the seven personal instincts.

The higher propensities are three in number :

1. *Attachment*,
2. *Veneration*, and
3. *Goodness*, or Universal Love.

The third and last of the social faculties is Universal Love, or " Humanity," as Comte terms it. Love of Humanity is the highest function of the Positivist Religion, as Charity is of the Christian. No wonder he should seek for it a position in the brain.

Were Comte's analysis correct, Universal Love should be an element of everyone's character, counteracted only by a larger force of selfish propensities. I

leave it to others to judge whether this is so. My own experience leads me to take a more pessimistic view of my fellow beings. I have not come across many individuals whose leading trait of character is Universal Love, and even of those who generally are credited with it, *i. e.*, Philanthropists, many have other motives to their action than those which are apparent.

The localisation of these three affections is just as arbitrary as the others; indeed, it is of no consequence where he places them, for he does not give us a particle of evidence as to why they should be located in one place more than in any other. The highest median portion of the frontal division he assigns to Humanity; Veneration he places immediately behind it, and Attachment occupies a lateral position. This leaves a space between the latter and the personal instincts, which he fills up with one of the three practical organs.

We have now to deal with the *speculative region.* Comte says that with regard to the intellectual functions he differs from Gall almost as widely as Gall differs from his metaphysical predecessors. On closer inspection we shall find, however, that he does not differ so very much from Gall. He accepts the principal division of the intellectual faculties, but makes use of more philosophic terminology. The only great difference seems to lie in not carrying the analysis of perception as far as Gall has done. The severe criticism which Comte at this juncture passes on him arises from a total misunderstanding of Gall's anatomical and physiological discoveries. He seems constantly under the wrong impression that Gall first constructed a philosophical system and then set to work to prove it; whereas Gall really made a number of discoveries respecting the brain, without any pretence as to an accu-

rate analysis of the faculties. Various followers have, like Comte, given to Gall's system a completeness, without clearly indicating what is their addition and what is original. Of all the critics, and they count by hundreds, not one has read Gall; they all judged him by the works of his followers. Moreover, the opponents for the last half-century have been able to say what they liked, there being no one to reply to them. Considering that Comte speaks so highly of Gall's genius in another part of his treatise, and weaves his teachings into his own, it surprises one to read at this point such criticism as the following:

"In the absence of all systematic method Gall constantly oscillated between the suggestions of his own mind and empirical observation, without ever proceeding on any regular plan. This fluctuation, however, which was then inevitable, did not seriously interfere with the first attempt to work out the physiology of the brain so far as the propensities were concerned. Here his logical deficiencies were compensated for by a powerful combination of two most efficient instruments—the common sense of mankind, and the observation of animals. In this subject no one has gone utterly astray except the philosophers, whose endless points of discord had done little except to hide the truth. In this part of the subject Gall's success was due rather to vigour of character than to intellectual superiority. When once he had broken entirely loose from metaphysical delusions as to the sovereignty of mind, popular instinct soon led him to see in actual life the heart was the principal arbiter. To examine its preponderance more thoroughly he was thus induced to employ the method of observation of animals, where there are no mental influences and social

institutions to complicate it. Consequently his special remarks on the various propensities are for the most part extremely judicious. The alterations and eliminations which I have found necessary are few and of secondary importance. All that was left for me to do was the important work of studying the affections as a whole, so as to form them into a progressive series; a task which Gall had not even attempted. With this exception the result of my own examination has been to adopt all his principal conceptions, statical as well as dynamical.

"But with the intellectual functions the case was altogether different. Here Gall was not helped by the study of lower animals; and the light derived from the common judgment of men was too confused, and needed the application of a theory beyond his grasp. Notwithstanding this, he burst vigorously through the oppressive confusion of metaphysical prejudice. His own conclusions were indeed shallow, and in every respect unworthy of him; still, ephemeral as they were, there was sufficient reality in them to assist me in ascending to the true encyclopædic point of view by founding the science of social life. Only from this higher level is it possible to discover the true laws regulating the nature and working of the intellectual functions. Abandoning as useless the self-inspecting process, we subordinate all theories of mind to the positive study of the collective evolution of the race; because it is only here that mental phenomena can display their real character. This, then, is the source of the very serious difference between Gall and myself on this great subject; a subject impossible to investigate adequately till the completion of my philosophical treatise."

While I agree with Comte that the self-inspecting process has not assisted the discovery of mental laws, I differ from him in ascribing to the study of the collective evolution of the race the possibility of localising brain functions. This study might be very useful in many respects, but it would not assist us in the enquiry which Gall instituted, and on which Comte is speculating; that is: What are the fundamental faculties and their physical conditions? We must not forget that Comte, like Gall, does not go beyond physiological psychology, a subject which can make advance only by observation and experiment.

The first distinction in *intellectual* functions which Comte draws, is that between the faculties of *Conception* and the faculties of *Expression*. The latter presupposes the first and is subordinate to it.

"Spontaneous evidence of this close connection is afforded by the fact that all Western languages designate the reasoning process by a term which, if traced back to its Greek root, would express simply Speech. Conversely, in Italian, the word *Ragionare* is used for mere exposition, be it even the simplest statement of fact. But, associated as these functions are, they are distinct, and must not be confounded. In diseased states they are often separated, the one being exalted, the other lowered. During infancy language is developed before reasoning, so that instruction always begins by mere formulas, leaving the meaning to be learned afterwards or not at all. Even in the mature state this plan is not altogether dispensed with."

We have two sorts of Conception,—one passive, the other active,—adjusted to each other, but still fundamentally distinct. The first of these in man may be called *Contemplation;* the second, *Meditation*.

Comte holds Gall's view—"In spite of theological and metaphysical prejudices which exalt these faculties into an exclusive privilege of our own race, both undoubtedly exist, in various degrees of inferiority, throughout the higher part of the animal kingdom. For with animals, as with ourselves, they are more or less necessary for personal, domestic, and, above all, for social life; and this for herbivorous as well as for carnivorous races. Necessities of nutrition, sexual relations, attention to offspring, are constantly evoking observations and reflections, which we in our stupid conceit fail to perceive."

Comte recognises two modes of Contemplation. The essential characteristic of the first is to be "synthetic"; it refers to objects; it deals, therefore, with the *concrete* aspect of things; from it we derive cognitions which are real but special; it is more used in art, whether technical or æsthetic. The second mode of Contemplation is "analytic." It takes cognisance of events; its nature is therefore *abstract;* from it we get conceptions which are general, but more or less factitious; it is more used in science.

The Meditative function is decomposed into *Induction* and *Deduction;* two distinctions universally accepted.

"It is clear that the act of meditating can be performed in two very distinct ways; that is to say, either by laying down principles or by deducing consequences. The first is the process of comparing; the second of coordinating. The former ends in Generalisation; the second in Systematisation. The distinction is apparent in every complete classification, the first process of which is to apprehend these groups in hierarchical succession. Again, taking a still wider field, we find in-

ductive meditation more concerned with relations of similitude; that is to say, with statical relations; and deductive meditation with relations of succession — that is, with dynamical relations."

As regards the localisation of the intellectual faculties, Gall's discovery that the frontal lobe is the seat of intellectual operations is confirmed by modern experimental research, as also by numerous pathological observations. Comte does not throw the smallest light on the question, but, with his usual confidence, says: "It will be enough to remark that the contemplative function should be placed in the lower portion of the frontal region, leaving the higher portion to meditation." As his motives for this localisation he gives: (1) the desirability of bringing the sensory organs into as close connection as possible with that cerebral function which alone is directly concerned with their operations; (2) the desirability of placing as near as possible to the affective region that intellectual organ which, when supplied with information from without, passes the final decision upon the impulses proceeding from the various propensities. A third motive not stated by Comte might be added: because Gall places the two groups in the same regions. Voluminous evidence has been furnished by himself and some of his more scientific followers.

I cannot follow Comte, however, in his localisation of abstract observations in the median line, and concrete contemplation laterally to it, nor is there any evidence why deductive reasoning should have a median location and inductive logic a lateral position.

The fifth intellectual organ is *Language*, under which Comte does not understand merely articulation of speech, but all sorts of communications more or less

artificial, as cries or gestures. As regards its localisation he says:

"Our previous localisations leave only one place unoccupied for this fifth intellectual organ, namely, the lateral extremity of the speculative region; the remainder being already filled by the contemplative and meditative organs with the exception of the space previously allotted to the sensitive ganglia. It would commence, therefore, at the middle of the anterior margin of the frontal region, and extend in the direction of the temple. And this indirect solution may be supported on subjective grounds, the portion assigned to this organ being midway between the eye and the ear, its principal auxiliaries. It is, moreover, approximated to the active region, with which it is intended specially to co-operate, as the only link connecting it with the speculative region."

The last group of faculties we have to consider form the *Character* proper. They are: 1. Courage; 2. Prudence; 3. Perseverance.

"Every being endowed with active powers should have *Courage* in undertaking, *Prudence* in execution, *Firmness* in accomplishment. No practical success can be attained without the union of these three qualities. And conversely, their combined action, circumstances being sufficiently favourable, ensures the realisation of every project well inspired and wisely planned. Each of these attributes is in itself as independent of the heart, properly so called, as of the intellect, although its practical efficiency depends materially upon both. Their action, separately considered, is essentially blind; equally inclined, that is, to forward all designs, whether bad or good, under the impetus of a sufficiently strong desire. And thus it is that we find many animals

superior to us in energy, in circumspection, or in perseverance,—sometimes, perhaps, even in the combination of these qualities,—and yet not able to utilise them as Man is enabled to do by his moral and intellectual superiority, especially when developed socially."

With reference to the localisation Comte states a very good reason for placing these three faculties between his organ of veneration and his industrial instinct, there being no other places available. But he assures us, even had there been space, he would have placed the three organs midway between the three classes of "propensity," superior, middle, and inferior, by reason of the impulses from which they are successively influenced.

This completes the analysis of "The Human Soul into eighteen faculties as follows:

The Heart.	Personal.	1. Nutritive Instinct (for the preservation of the individual).	
		2. Sexual " (" " of the race).	
		3. Maternal " (" " ").	
		4. Military " (for improvement).	
		5. Industrial " (" ").	
		6. Pride.	
		7. Vanity.	
	Social.	8. Attachment.	
		9. Veneration.	
		10. Benevolence.	
Intellect		11. Concrete Contemplation	Conception.
		12. Abstract "	
		13. Inductive Meditation	
		14. Deductive "	
		15. Language, Expression	
Character		16. Courage.	
		17. Prudence.	
		18. Perseverance.	

I have criticised Comte's *Analysis of the Human Faculties* only in one light, that namely of "physiological

psychology" of which Gall was the originator. The quotations are sufficiently lengthy to enable readers to judge of it as a "speculative" system. In any case Comte himself had a high opinion of it, and prophesied it as being of great practical value.

Yet, after all that has been said, we ought to admire Comte for his courage in undertaking to solve a problem which even Mr. Herbert Spencer shrank from, and for his still greater courage in acknowledging his indebtedness to Gall in face of almost unanimous opposition. For these reasons Auguste Comte deserves our respect, though the results of his "analysis of the human faculties" are far from what he himself calls "positive."

CHAPTER XII

TESTIMONY AS TO THE TRUTH AND USEFULNESS OF PHRENOLOGY BY EMINENT MEDICAL MEN

1. Its Usefulness in the Study and Treatment of Insanity.

   By Dr. Conolly, Sir James Coxe, Dr. W. A. F. Browne, Sir James Crichton-Browne, Dr. Daniel Hack Tuke, Sir William C. Ellis, etc.

2. Sir Samuel Wilks's Testimony.

3. Other Testimony.

   By Sir William Turner, Sir Frederic Bateman, Sir John Forbes, Dr. David Ferrier, Professor Benedikt, Drs. Carpenter, Guy, Abernethy, Solly, Laycock, L. Forbes Winslow, Havelock Ellis, Professor Bain, Mr. John Morley, etc.

CHAPTER XII

TESTIMONY AS TO THE TRUTH AND USEFULNESS OF PHRENOLOGY BY EMINENT MEDICAL MEN

1. Phrenology and its Usefulness in the Study and Treatment of Insanity

THE following quotations are taken from authors —all specialists for the treatment of the insane, some of whom have attained to the highest repute in their department of medicine—who were so misguided as to place belief in "these infernal idiots, the phrenologists" (*Blackwood's Magazine*, No. 76, p. 593), and to adopt this "thorough quackery," this "collection of mere absurdities," "this trash," this "despicable trumpery" (*Edinburgh Review*), and who have even declared that "insanity can neither be understood, nor described, nor treated, by the aid of any other philosophy" (W. A. F. Browne, Her Majesty's Commissioner in Lunacy for Scotland). It is not very encouraging to declare oneself in favour of phrenology when one has to encounter the following: "We have already said that in our opinion 'fool' and 'phrenologist' are terms as nearly synonymous as can well be found in any language" (*Blackwood's Magazine*). It is due, however, to the teaching of these "fools" and to the

diffusion of Gall's doctrines that the reform in the treatment of the insane at the beginning of last century took place. Modern alienists will be surprised as to how many of their renowned predecessors have acknowledged the usefulness of phrenology in the study and treatment of the insane.

Dr. Conolly's testimony (*Journal of Mental Science*, July, 1879, vol. xxv., p. 238).—"To those who were personally acquainted with Dr. Conolly his favourable opinion of the system of Gall and Spurzheim is well known. In his *Indications of Insanity* (1830) he maintains that 'the first principles of phrenology are founded in nature,' and adds, 'I can see nothing which merits the praise of being philosophical in the real or affected contempt professed by so many anatomists and physiologists for a science which, however imperfect, has for its object the demonstration that for other functions the existence of which none can deny, there are further separations and distinctions of hitherto unexplained portions of nervous matter' (p. 135). And in a letter to George Combe himself, Dr. Conolly expresses his 'conviction of the great usefulness of habitual regard to the principles of phrenology, especially in my department of practice, and of the confusion and imperfection of the views which seem to me to be taken both of sound and unsound mind by those who reject the aid of observations confirmed now by vast experience, and most of which may be daily verified in asylums for the insane. *I am also convinced that attention to the form of the head*, conjoined with that cautious consideration of all other physical circumstances which no prudent phrenologist disregards, *will often enable the practitioner to form an accurate prognosis* in cases of mental disorder, and to foretell the

chances of recovery or amelioration, or hopeless and gradual deterioration.'"

This remarkably explicit letter is quoted by Sir James Clark in his memoir of Conolly, and Sir James himself observes, after citing certain passages from modern physiologists favouring the localisation of cerebral organs: "These observations, which are founded on inquiries into the anatomy and physiology of the brain, strengthened by recent discoveries in pathology, all point in one direction, and tend to suggest the opinion of the phrenologists that the brain is an aggregate of many different parts, each appropriate to the manifestation of a particular mental faculty. The prediction of the late Dr. Andrew Combe, the most sagacious and far-seeing of all British writers on phrenology, that a possible position of importance awaited it in the future, appears to rest on a surer foundation than has sometimes been imagined."

Testimony of Sir James Coxe, Her Majesty's Commissioner in Lunacy. Extract from the Presidential address delivered at the Royal College of Physicians, London, 26th July, 1878, by Sir J. Crichton-Browne.—"From the commencement of his career Sir James Coxe interested himself in insanity. During the earlier stages of his professional training he enjoyed no opportunities of coming into contact with the cloistered insane, nor of observing the modes of treatment then resorted to, as lunatic asylums were not in those days open to students, and were unprovided with medical assistants; but this disadvantage was, to a great extent, compensated by his having acquired from his relatives, George and Andrew Combe, a thorough knowledge of phrenology, which—not then fallen on evil days of charlatanism and into the evil

companionship of mesmerism—encouraged the accurate observation of mental states, accentuated the relations subsisting between these and states of the nervous system, and had even some curious glimpses of foresight into the revelations of modern physiology. He saw the phrenological method of inquiry applied in cases of insanity and of peculiar turpitude in the communities of lunatics and criminals that he visited during a long sojourn on the Continent, and the influence of the information thus obtained, co-operating with the natural bent of a comprehensive but unimaginative mind, may be discerned in all his subsequent public and official acts."

The following is the testimony of W. A. F. Browne, Her Majesty's Commissioner in Lunacy for Scotland, (father of Sir James Crichton-Browne): "To those who are acquainted with the doctrines of Phrenology, the extent of my obligations will be readily recognised; and to those who are still ignorant of these doctrines, I have to offer the assurance that *insanity can neither be understood, nor described, nor treated, by the aid of any other philosophy.* I have long entertained this opinion. I have for many years put it to the test of experiment, and I now wish to record it as my deliberate conviction."

(*What Asylums Were and Ought to Be.* This work was dedicated to Dr. Andrew Combe "as an acknowledgment of the benefits which he has conferred on society by his application of Phrenology in the treatment of insanity and nervous diseases.")

Dr. Browne to the Hon. A. Boardman: "I hereby

certify that I have been acquainted with the principles of phrenology for upwards of ten years; that from proofs based upon physiology and observation I believe these to be a true exposition of the laws and phenomena of the human mind; that during the whole of the period mentioned I have acted on these principles, applied them practically in the ordinary concerns of life, in determining and analysing the characters of all individuals with whom I became acquainted or connected, and that I have derived the greatest benefit from the assistance thus obtained. But although the utility of the science be most apparent in the discrimination of the good from the bad, those of virtuous and intellectual capabilities from the brutal and the imbecile, it is not confined to this. In the exercise of my profession *I have been enabled, by the aid of phrenology, to be of essential service in directing the education of the young as a protection against nervous disease, and in removing or alleviating the various forms assumed by insanity in the mature.* For several years I have devoted myself to the study of mental diseases and the care of the insane. During my studies at the Salpetrière, Charenton, etc., in Paris I was able to derive great additional information from my previous knowledge of phrenology, and now that I have been entrusted with a large asylum I am inclined to attribute any little success that may have attended my efforts to ameliorate the condition of those confided to my charge, to the same cause."

Testimony of Sir James Crichton-Browne, M.D., Lord Chancellor's Visitor in Lunacy.

"To the illustrious founders of phrenological science psychology owes much; for those who have had the greatest opportunities of observation have almost in-

variably come to the conclusion that *without an acceptance of the general principles of phrenology, mental disease can neither be understood, nor described, nor treated.*

"Phrenology has been despised by the many and opposed by the learned in the most illogical and dishonest manner, and yet it still exists, and now begins to take up its proper position among the sciences. Its great doctrines are now openly or tacitly acknowledged by the great majority of medical and by several metaphysical writers, *and many have earned fame by giving them to the world without confessing their derivation.*"—(*Journal of Mental Science*, 1861.)

Sir James Crichton-Browne, to the editor of the *British Medical Journal*, 16th November, 1861, in reply to a paragraph welcoming the decision of the Newgate authorities not to allow a cast of the convict Cogan's head after execution:

"Now, sir, it has been observed that the human mind has usually opposed a passive and instinctive resistance or *vis inertia* to the progress of new ideas, even when of the most simple and palpable description; and it has also been remarked that where the new doctrine treats of matters not lying on the surface, and when it appears to clash with established views on points in which the feelings are apt to be interested, an active, passionate, and vehement opposition may be looked for. *It had been hoped that the diffusion of knowledge at the present day, and of liberal and enlightened opinions on scientific subjects, and also the length of time during which phrenology has been before the public would have secured for it a more calm and fair examination than it at first received or even now receives.*

"The paragraph quoted above was, therefore, read

with considerable surprise and much regret, for it unmistakably shows that the Newgate authorities are animated by feelings tyrannical and unfair towards phrenology, and that the Newgate surgeon is actuated in the present instance by sentiments anything but enlarged and philosophical. It is surely unjust that a whole doctrine should be rejected, and its patient students stigmatised as quacks and promulgators of 'vagaries,' by men who have never looked at a brain or skull with a view to discover the relation they might bear to mental manifestations. It is not at all material to the question before us whether phrenology be true or false. Whether true or false, it appeals to facts and to nature, and no logical opponent would attempt to prevent its disciples from accumulating observations, which will militate against themselves if phrenology be false, and which will go further to refute it in such a case than the *a priori* arguments with which it is frequently met. The interference of the Newgate authorities must be regarded with apprehension, for why should not pathological 'vagaries' be extinguished by putting a stop to '*post-mortem* examinations'?

"I know not by whom the application for Cogan's head was made. Very probably by some of those charlatans and quacks who prostitute science, but who, at the same time, often collect valuable materials to be used by its legitimate followers. I cannot help thinking that a cast of the convict's head might have been interesting and useful, even apart from its phrenological significance, and I regret that it was not procured."

Testimony of Dr. Daniel Hack Tuke (*Journal of Mental Science*, vol. ii., 1856, p. 447).—"We owe, however, I think, something to the phrenological school

for their analysis of the mind, which (whatever may be the fate of Gall's cerebral physiology) is more practical than any which preceded it, and probably many are not aware to how considerable an extent they assume the truth of the divisions of the phrenologists."

He divides the disorders of the mind into forms of unsoundness, involving—

(1) The intellect—idiocy, imbecility, dementia, incoherence, exaltation, hallucinations, illusions.
(2) The moral sentiments—melancholia.
(3) The animal propensities.

Other Testimonies

Sir William C. Ellis, physician to the Hanwell Asylum, candidly owned that until he "became acquainted with phrenology he had no solid basis on which he could ground any treatment for the cure of the disease of insanity."

Dr. James Scott, of the Royal Hospital at Haslar: —"I unhesitatingly give it as my deliberate conviction that *no man*, whatever may be the qualification in other respects, *will be very successful in the treatment of insanity*, in its various forms, *if he be not well acquainted with practical phrenology;* and I will add that whatever success may have attended my own practice in the lunatic asylum of this great national establishment, over which I have presided as chief medical officer for many years, I owe it, almost exclusively, to my knowledge of phrenology."

Dr. Glendinning (*Clinical Lectures*, 1842).—"The business of reform," says Dr. Glendinning, "in mental science, has been resumed on other and sounder principles by Dr. Gall; and phrenology will, I doubt not,

generally be regarded as the only system before the public that makes any tolerable approach to what the enlightened common sense of mankind can recognise as well in science, or useful for practical purposes. It was the study of insanity very much that gave Gall the clue; and people are unconscious witnesses against, and telling illustrations of the unsoundness of, the earlier systems."

2. Sir Samuel Wilks on Phrenology

The reflections of Sir Samuel Wilks, M. D., *late President of the Royal College of Physicians, London: On Phrenology* and the history of the Physiology of the Nervous System.

Relation of brain and mind:

"It seems astonishing at the present time, when phrenological societies have ceased to exist, and we look calmly back on the achievements of their members, to contemplate the bitter animosity which was exhibited towards them by their opponents in all classes of society. *Physiologists simply ignored them*, and looked upon the attempt to apportion out the brain into organs corresponding to the functions of the mind as gratuitous and fanciful; whilst the literary and religious public became their bitterest antagonists because they made mental processes depend upon organisation. The virulence and abuse poured upon phrenologists by reviewers and magazine writers would seem almost incredible were not the evidence before us to attest it, and even the better class of writers, as Lord Jeffrey and Lord Brougham, declared that they had no patience with these materialists. The former, for example, remarks, 'There is not the smallest reason for supposing that the mind ever operates through the

agency of any material organs, except in its perception of material objects or in the spontaneous movements of the body which it inhabits'; while Lord Brougham asserts that 'the ordinary course of life presents the mind and the body running courses widely different, and in great part of the time in opposite directions, and this affords strong proof that the mind is independent of the body.'

"It was true, of course, that phrenologists were materialists, in the sense that they endeavoured to associate all mental phenomena with the brain. They did not hesitate for a moment to state the principle on which their new science was founded, and one of their leaders, Dr. Engeldue, was the first who used the term *cerebration* to designate the operation of the brain. They discarded the psychical notion of the human individuality, as expressed by Addison in the *Spectator*, where he says, 'What we call the faculties of the soul are only the different ways or modes in which the soul can exert itself'; but they announced their doctrine as expressed by one of the earliest teachers of the system in such words as these: 'The right method is at last attained. Mind is studied as it is constituted by the Creator in its natural relation to the body, not in a state of fanciful existence. The facts of the physiologists are substituted for the phantasies of the metaphysicians. Locke talked of an algebra of morals. Phrenology almost holds out the prospect of realising such an idea. It unites into one the philosophy and physiology of man.' And Spurzheim, in speaking of the older methods of mental philosophy says: 'One fact is to me more positive and decisive than a thousand metaphysical opinions.'

"There were, however, a few amongst the orthodox

members of the profession who looked with not unkindly eyes on the new doctrine. Thus Dr. James Johnson, the well-known editor of the *Med.-Chir. Review*, observes: 'I have long been convinced that the science of mind can only be understood and taught properly by those who have deeply studied the structure and functions of its material instrument, the brain. I am convinced that in this world mind can be manifested only through the medium of motion, and that the metaphysician who studies mind independent of its corporeal organ works in the dark, and with only half of his requisite tools. Without subscribing to all the details of phrenology I believe its fundamental principles to be based on truth.'

"In myself considering phrenological works in an unprejudiced spirit I cannot but be struck with the great object which the writers presented to themselves, and the mode in which they proposed to prove the truth of their doctrine. Their object was the same as that which is now considered most rational. They discarded the notion that the brain was to be regarded simply as associated with the mind and there left, but they looked upon it as a compound and complex organ. They were the first who replaced the old method of anatomists of slicing up the brain by unfolding and dissecting it. They showed that it was made up of parts, each having its own function. They erred no doubt in hastily framing a system whose correctness did not admit of proof [the system was founded by Spurzheim, not by Gall.—B. H.]; but out of it arose discussions on the different faculties of the body and mind, which must have made the phrenological societies in London overflow with interesting debates. They discussed the subject of language in a manner which

had never before been attempted, as well as co-ordination, time, the muscular sense, the feeling of resistance, and kindred subjects. Aphasia, indeed, seemed clearly understood, and *language was located by them in the region where physiologists are now agreed to place it.* If phrenologists had not stated so strongly their belief in the existence of separate organs in the brain, but had used their system merely as an hypothesis, no objection could have been urged against it, for it developed for the first time a number of theories as to the nature of the different faculties of the mind. The transactions and reports of the old phrenological societies give accounts of debates on subjects of the deepest interest, *such as can nowhere be found in the records of other learned societies*, for, on the one hand, there was merely the metaphysical system to explain mental phenomena ; and, on the other, the simple physiological one which, gave little more account of the brain or its functions than could be discovered in the laboratory by experiments on animals.

"The opposition they raised was due to their assumption of the functions of the surface of the brain, whereas it was clear to physiologists that it had other properties than those assigned to it by phrenologists. The latter were, however, able to answer the objection 'that injuries of the brain were not attended by loss of that mental quality which the new system would demand,' by declaring that the brain was double, and they did not even deny that the brain had other functions than those of mental action.

"I think it must be admitted that they truly did hold such an opinion, for it may be remembered that many of the phrenologists associated themselves with

the mesmerists, producing as a resultant a new class, the electro-biologists, whose practice was to pass the hand over the different organs of the brain, and excite them to action. By this means they aroused the activity of these organs, and brought out not only some mental faculty, but at the same time a movement of the body in correspondence with the excited thought or emotion. *The electro-biologists were thus both teaching and practising what the most advanced physiologists are now supposed to do in their laboratories* when exciting certain convolutions of the brain by the galvanic current.

"This intimate relation between a mental act and the associated gesture was one of the interesting questions discussed by phrenologists, and they alluded to the well-known fact that actors, by playing a part where some passion is depicted by a peculiar attitude or gesture, will themselves at last become the actual subject of that passion in all its intensity, so that a position of grief will induce a sorrowful state of feeling, a fighting attitude bring out a pugnacious tendency, or a humble posture of worship induce a dependent frame of mind.

"That they also associated the will and movements with the anterior portions of the brain may be seen in the writings of Dr. Combe, the great apostle of Phrenology. He maintained that the anterior lobes were connected with the will, and that their convolutions bore an analogy to the peripheral expansion of a simple nerve of motion. The fibres which ultimately constitute the convolutions, although proceeding from the motor and sensory tracts, may reasonably be presumed to perform functions distinct from motion and sensation. One view is that they are the organs of mental faculties which *use* muscular motion and sensation as their instruments of manifestation, and the relations of

the convolutions to the two tracts in question accord with this view." Dr. Wilks proceeds to give:

(1) Gall's method of dissection of the brain and some of his anatomical discoveries.

(2) The phrenological view of the use of the double brain.

(3) Gall's discovery of aphasia and the seat of language.

(4) The discovery of the "muscular sense" by phrenologists.

(5) The phrenological theory of sleep.

(6) Gall and Rolando's views of the functions of the cerebellum.—(Guy's *Hospital Reports*, 1879, vol. xxiv.)

3. Other Testimony

Sir William Turner, Professor of Anatomy in Edinburgh University, writing in 1866, observes in *The Convolutions of the Human Cerebrum Topographically Considered* that "the precise morphological investigations of the last few years into the cerebral convolutions have led to the revival in Paris of discussions in which the doctrine of Gall and his disciples —that the brain is not one, but consists of many organs—has been supported by new arguments, and the opinion has been expressed that the primary convolutions, at least, are both morphologically and physiologically distinct organs."

Dr. David Ferrier, F.R.S.—"To Dr. Gall let us pay the tribute that in his analysis he followed strictly inductive methods, and made many observations of enduring value."

Sir Frederic Bateman.—"In spite of all that has been said against Gall, and all that has been written in depreciation of his labours, beyond all doubt his

researches gave an impulse to the cerebral localisation of our faculties, the effect of which is especially visible in our own days; and *I look upon his work as a vast storehouse of knowledge*, and as an imperishable monument to the genius and industry of one of the greatest philosophers of the present age."—(*Aphasia or Loss of Speech*, London, 1890.)

Moriz Benedikt, Professor of Neurology, University of Vienna.—"The doctrine of the localisation of the psychical elements on the cerebral surface, rejected a short time since on the ground of prejudices and false experiments by most persons, is now an incontestable fact of exact science."

Sir John Forbes, M.D.—"*Phrenology embodies many facts and views of great general interest and direct practical utility to the physician, the philosopher, and the philanthropist;* and that as such, it has established claim to a more careful, serious, and impartial examination on the part of the profession than it has ever yet received."—(*British and Foreign Medico-Chir. Review.*)

Dr. Carpenter, in reviewing Dr. Noble's work, *The Brain and its Physiology*, 1846, by far the ablest defence of phrenology from a medical pen in those times, observes in support of phrenology: "There is a very general correspondence between certain forms of the cerebrum, arising from the cerebral development of its different portions, and certain leading diversities of character, which might not unfairly be regarded as indicating that these several divisions are the special instruments of particular groups of intellectual or moral faculties."—(*British and Foreign Medico-Chir. Review*, 1846.)

Dr. Guy, Professor of Forensic Medicine at King's

College, London :—"To Gall and his followers is due the great merit of having directed attention to those faculties which are the real source of action—the emotions and passions; and *to them must be ascribed the praise of having originated the simplest and by far the most practical theory of the human mind.*"—(*Text-book on Forensic Medicine.*)

Dr. Abernethy.—"I readily acknowledge my inability to offer any rational objection to Gall and Spurzheim's system of phrenology, as affording a satisfactory explanation of the motives of human conduct."

Dr. Samuel Solly, Lecturer on Anatomy and Physiology in St. Thomas's Hospital.—"I do not see it [phrenology] as otherwise than rational, and perfectly consistent with all that is known of the functions of the nervous system."

Dr. Laycock, F.R.S.E., Lecturer on Medical Psychology in the University of Edinburgh.—"That a minute Cranioscopy founded on the European type is applicable to all races of men may well be doubted; *but all agree in admitting the great regional divisions of Phrenology.*"

Littleton Forbes Winslow, M.D., D.C.L.—"The correctness of their [the phrenologists'] localisation of the functions of the brain becomes at once so plainly demonstrated that *the non-acceptance of Phrenology is next to impossible.*"

Dr. James Johnson, Physician to King William IV. —"Those who sneer at Phrenology are neither Anatomists nor Physiologists. Special mental qualities have a special configuration of the head."

Havelock Ellis.—"Gall thrust aside for ever the credulous fancies of the physiognomists; and he has been described, not altogether without reason, as the

founder of the modern science of criminal anthropology. He was certainly its most brilliant pioneer. . . . Gall studied the brain, sought to differentiate the functions of its various parts, and the effects of its varying development on the skull.

"For Gall the varying development of the brain was the cause of the divergent mental and moral qualities of the individual; he was firmly convinced that all the facts of psychical life are rooted in the physical organisation; he wished to write the natural history of every primitive, moral, and intellectual force, in health as well as in disease. To the best of his ability he carried out his programme in detail, by an unceasing study of all the varieties of the brain and of the living head that he could find; he pursued his studies throughout Europe, in lunatic asylums and in prisons, as well as among the ordinary population, and he foresaw the extent of the applications of the science he was opening up to medicine and to law, to morality and to education. While his work extended far beyond the borders of what we should now call criminal anthropology, he devoted much attention to the problems of the criminal organisation, and even to its varieties, many of his observations according well with the results of recent investigation. More than this, he clearly advocated a method of dealing with the crimi nal which is now widely regarded as the only right and reasonable method. 'There can be no question,' he said, 'of culpability or of justice in the severe sense; the question is of the necessity of society preventing crime. The measure of culpability and the measure of punishment cannot be determined by a study of the illegal act, but only by a study of the individual committing it.' In his great work *Les*

Fonctions du Cerveau, Paris, 1822, Gall has summed up his conclusions."—(*The Criminal*, London, 1890.)

The testimonial of Dr. Howe, the founder of the Perkins Institution for the Blind, who educated Laura Bridgman, the blind, deaf, and dumb woman, on phrenological principles, as to the advantages derived by himself and the other teachers from phrenology: "Before I knew Phrenology," says he, "I was groping my way in the dark as blind as my pupils; I derived very little satisfaction from my labours, and fear that I gave but little to others."

In the *Memoir of Dr. Howe*, 1876, Julia Ward Howe says: "More congenial to him was the company of George Combe, the distinguished phrenologist, whose treatise, entitled *The Constitution of Man*, Dr. Howe considered one of the greatest works of modern times. . . . Dr. Howe had paid much attention to the study of phrenology, and, like Mr. Combe, was much interested in tracing out some confirmation of its theory in the characteristics of Greek Sculpture. The two friends now visited together the gallery of the Vatican, and studied its historic heads in the light of their favourite science. They found the head of Jupiter as full of the majesty of intellect as are his features. In Pallas, the intellectual type of woman's head prevailed, while the head of Aphrodite was small, with a predominance of the organs of sensation over those of thought. The whole series of the Cæsars, too, was followed with corresponding instruction and satisfaction."

Dr. James Macartney, Professor of Anatomy and Surgery, Trinity College, Dublin, used to say that Spurzheim's dexterity in dissecting the brain was inimitable, and that his method was the only true one. (Quoted by Dr. James T. Browne, Edinburgh, 1869.)

Professor Bain, of Aberdeen University.—"Phrenology is the only scheme of human character that has hitherto been elaborated in a manner proportioned to the subject."—(*On the Study of Character*, 1861.)

Hence we find Archbishop Whately writing to George Combe that he is convinced that even if all connection of the brain with mind were regarded not merely as doubtful, but as a perfect chimæra, still the treatises of many phrenological writers, and especially Mr. Combe's, would be of great value, from their employing a metaphysical nomenclature "far more logical, accurate, and convenient than Locke, Stewart, and other writers of their school had done."

Mr. John Morley, speaking in his "Life of Cobden" of the author of the *Constitution of Man* (Mr. George Combe), says: "Few men have done better work than the author of the *Constitution of Man*. That memorable book, whose principles have now in some shape or other become the accepted commonplaces of all rational persons, was a startling revelation when it was first published (1828). . . . We cannot wonder that zealous men were found to bequeath fortunes for the dissemination of that wholesome gospel, that it was circulated by scores of thousands of copies, and that it was seen on shelves where there was nothing else save the Bible and *Pilgrim's Progress*."

Yet the trustees of the fund for the dissemination of phrenology, referred to by Mr. John Morley, have employed Dr. Andrew Wilson, a member of the medical profession, who has in all his writings to journals and in his books only made fun of and denounced phrenology, as "George Combe" Lecturer. His criticism we have already analysed. Its value may also be judged by

his acceptance of the post of a phrenological lecturer. What would George Combe and Mr. Henderson (who left £6000 for the propagation of phrenology) say to the trustees of their legacies, could they but speak ?

CHAPTER XIII

CONCLUSION

Summary of the Author's "Localisations."

Their Practical Use.

CHAPTER XIII

CONCLUSION

GALL, proceeding on strictly positive and inductive lines, labelled the regions of the brain in a rough-and-ready fashion with the names of the habits or actions he found specially associated with the developments of the respective parts, *e. g.* "mimicry," "homicidal mania," etc. Following out his method, it became comparatively easy to confirm his observations.

SPURZHEIM longed for a more abstract conception of the functions of the cerebral parts, declaring that Gall studied merely the abuses of the mental faculties. COMBE and the EDINBURGH SCHOOL adopted and upheld Spurzheim's terminology; but although this step may have been philosophical, it did but retard the recognition of phrenology, inasmuch as Gall's original observations were no longer recognisable under such terms as "imitation," "destructiveness," etc.; hence they could not be so easily verified, and afforded the antagonists undue advantages.

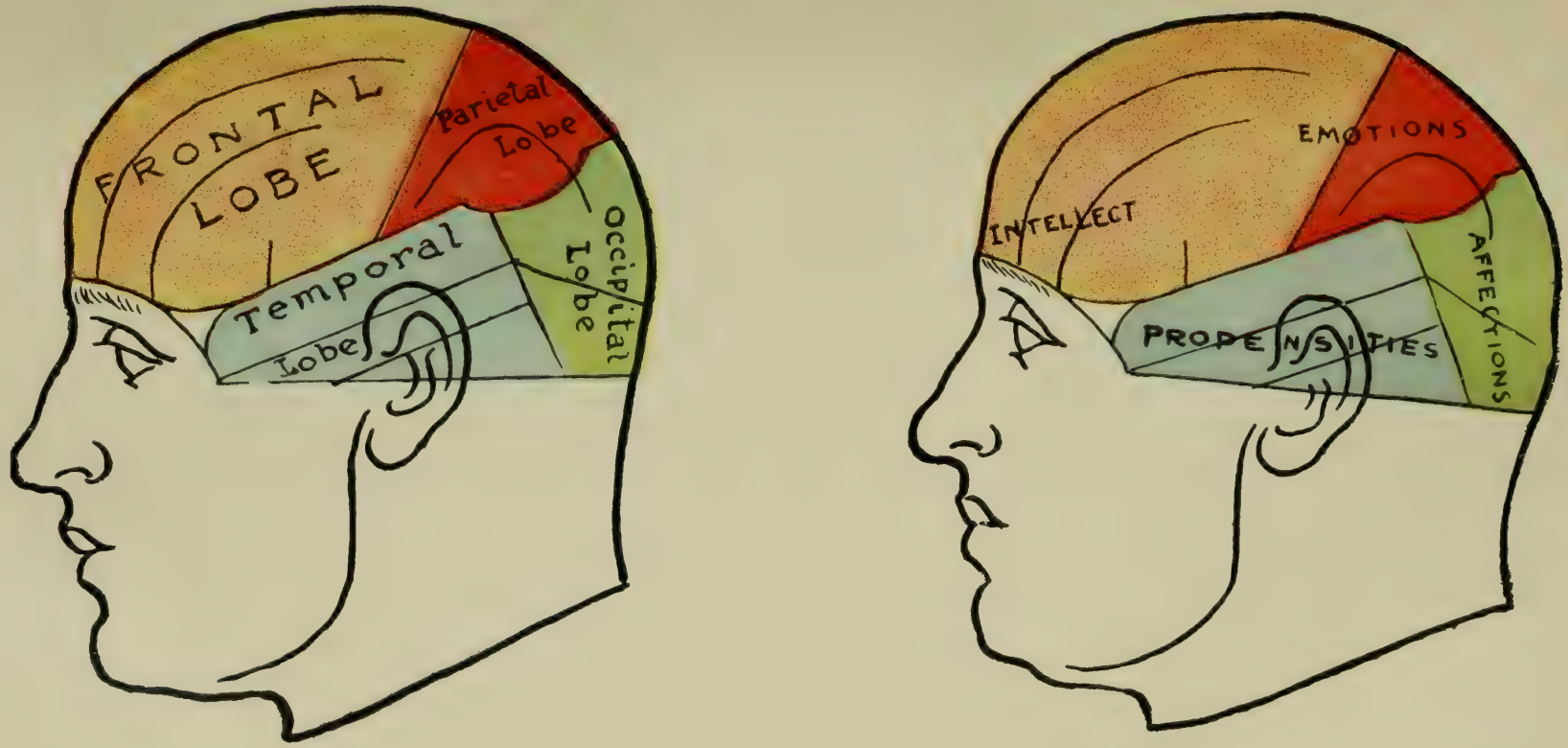
The author has made no attempt at a philosophic revision of the terms employed, preferring first to assure the foundation of the structure. He is content to have shown that Gall's crude observations have been confirmed by recent experiments and research. It will require the labours of many men, scientists

and philosophers, to construct thereon a complete system.

Certain of the "localisations" may appear founded on insufficient data, but this is no fault of the author's; science has made too little progress in this direction. Through the non-admission of "cerebral localisation," but few cases of localised disease or injury have been observed and recorded. Even with the author's knowledge of languages the search was no easy one. He has, however, by other methods, convinced himself of the probable correctness of such "localisations," so that an investigator, without accepting these as proven, may still keep them in mind by way of hypothesis, whenever opportunity occurs to turn them to account.

The method referred to is the one which medical men would hitherto not dream of undertaking, albeit affording the best test of the accuracy of the phrenological localisations. It amounts to the exposition of character by the development of brain and skull, not necessarily the manipulation of the head, for frequently, especially in cases in which mental specialists are consulted,—and as the illustrations in this book testify,—simple inspection suffices. It is one thing to read an average head, which implies merely average characteristics that may fit anybody, for the amusement of the individual and the pecuniary profit of the manipulator, the professional phrenologist; but it is quite a different matter to search out the causes wherefore some particular person proves a failure in life, or has developed tendencies that may ultimately land him in a prison or in an asylum.

While convinced that certain of the centres may require a great deal more of scientific evidence, such as has been furnished for "melancholia," "violent mania,"



The **anatomical** and **functional** divisions of the brain and their relation to the cranium.

"mania of persecution," and some other localisations, the author ventures, after fifteen years of accumulated experience, employed in such research, to formulate as highly probable:

1. That the *pre-frontal* lobes are concerned in the purely *intellectual* operations.

2. That the *temporo-sphenoidal* lobes are in some way connected with the *propensities* common to man with the lower animals.

3. That the *parietal* lobes and the *posterior part of the frontal* lobes are involved in the manifestation of definite *emotions;* while

4. The *occipital* lobes bear a relation to the domestic and social *affections.*

It may be maintained further:

5. That *size* of brain-mass bears a proportion to the *power* of manifestation, and that

6. Two brains or skulls differing in these regions will differ in character accordingly.

Take the masks, brains, or skulls of half a dozen persons afflicted with a deficiency of some definite mental faculty, or emotion, or passion, and of half a dozen who have excelled in such faculty, then jumble them together, and any individual tolerably versed in Gall's doctrine will find no difficulty in differentiating the two classes.

This work is not a text-book on phrenology. The author has attempted to localise some only of the faculties, demonstrable from their morbid manifestation to be connected with definite lesions in the brain, as:

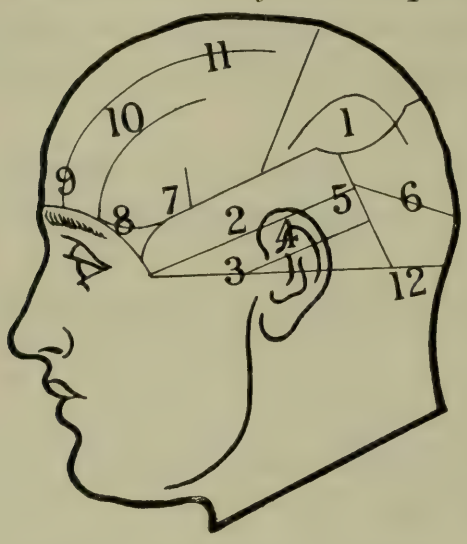
1. *Morbid Fear* and *Melancholia* with the *supra-marginal* and *angular* gyri of the parietal lobes.

2 and 3. *Kleptomania* and *Voracious Hunger and*

Abnormal Thirst with the *anterior part of the temporal* lobes, superior and inferior respectively.

4. *Irascibility* and *Violent Mania* with the *central part of the temporal* lobes.

5. *Mania of Suspicion and Persecution* with the *posterior part of the temporal* lobes.



6. The tender domestic and social *affections* with the *occipital* lobes.

7 and 8. *Perception of Tone* (Music), and of *Number*, with some part of the brain abutting on *the fissure of Sylvius.*

9. *Perception of "Form," "Size," "Place," "Colour," Memory of "Time," "Facts and Events,"* etc., with the *supra-orbital* gyri and adjoining parts of the *frontal* convolutions.

10. *Imagination*, and co-ordinated processes, with the *antero-superior part of the frontal* lobes.

11. *Religious Mania* and perversion of *altruistic sentiments* with the *postero-superior part of the frontal* lobes.

12. *Satyriasis* and *Nymphomania* with the *hemispheres of the cerebellum.*

The author has collected many other data: for example, as to the probable seat of lesion in idiopathic epilepsy, the mental changes consequent upon extension of ear-disease to the meninges and brain-substance, the characteristics of male and female brains and typical criminal brains, etc., which might be followed up by brain-investigators. Chief of all, however, *this book*

should enable the physician or surgeon, when he meets with cases in which the chief or perhaps the only symptoms are psychical, not physical, *to localise the seat of disease and to apply treatment accordingly.* A new sphere is thus opened up for the practice of our profession—to be *physicians to the mind* as well as to the body.

As already stated, it was not the author's aim or purpose to prove in this work the whole scope of Gall's doctrine; but *he does claim to have furnished a key to many of the mysterious problems of mental science.* Our modern lunacy specialists are without any key whatever to unlock the vast problems connected with the correlation of mind and brain. The key offered may be rough indeed, and with some strange twists in it, but a key nevertheless, which, despite its defectiveness, may correspond with many of the wards of locks hitherto left unopened by science and philosophy. Considering how important it is to diagnose the earliest and slightest deviation from the normal psychic functions, and that several of the founders of medical psychology in this country have been more or less "phrenologists," specialists in this line should accord to the present work fair consideration, if not an entire acceptance.

The author has neglected no opportunity of studying not merely the *science* but the *art* of phrenology, and as one of the founders and honorary officials of the leading Phrenological Society in this country, now incorporated by the Board of Trade, has come in contact with and was able to observe the methods of both professional and amateur phrenologists. As a result of this experience he is enabled to affirm that while the want of education and culture of some of them is

really deplorable, the more serious of them read character so correctly as to astonish any unprejudiced mind. Numerous tests have been devised by the author and other amateurs to prove the correctness of the manipulators, and were carried out so successfully as to earn the acclamation of the public audiences.

This declaration may evoke a smile on the part of some, but the author has seen so much good come from these consultations when the inquirer had a serious motive, and had not come for a frivolous purpose or mere amusement, that he feels bound to state what is his honest conviction. At the same time let him not be misunderstood. *Phrenology will be a science only when all the different methods of research have proved it to be so*, and not merely the single method of comparison of heads. Let all who are in a position to turn it to account keep phrenology before them as a "theory," and ample progress will speedily be achieved. If men of education will but apply its principles they will be more successful than the class in whose hands it is now ; and they will wipe this opprobrium from the science in the only way in which it can be removed—by substituting a better practice in its stead. What must surgery have been in the time of the barber-surgeons, and what height has it not attained to nowadays ?

Let no one deem, however, that to decipher an individual's tendencies by the inspection of the head is to be regarded as so easy that he need only purchase one of the "toy busts," and start practising in his own home. He will need much study and a considerable amount of practical experience ere he can delineate a character. As to this *art* of practically applying phrenology, a far different volume would have to be written.

Referring to practical phrenology, Dr. J. W. Eastwood, formerly lecturer on physiology, Sheffield School of Medicine, has expressed himself to this effect:

"Some years ago I had an excellent opportunity of testing the practical value of phrenology as a means of judging character. A most intelligent and earnest phrenologist examined the heads of a number of friends and acquaintances of my own; and I have notes of twenty-one of these cases, consisting of medical men, clergymen, and other professional persons, of ladies, and children. In no instance had the operator ever before seen the individuals examined, and as I knew them so well he appealed to me to correct him when he was wrong. I can only say that the descriptions were so accurate as to afford striking evidence of the truth of phrenology."

"By limiting and modifying its extreme pretensions it is possible yet to gain something from it, whereby a true system of craniology may be evolved. It will require many observers to succeed in it, and much careful observation is needed; but the result will repay the labour of those who engage in the work. If we are enabled by these means to understand the morbid manifestations of the brain for the classification of its diseases, for the diagnosis of insanity, we shall render great service to the special branch of the profession in which we are engaged."—(*Journal of Mental Science*, 1872, vol. xvii.)

Her late Majesty, Queen Victoria, has shown the use that can be made of phrenology in the education of the young according to their peculiar talents and dispositions, which otherwise oftentimes remain unrecognised until they are developed, when the knowledge may come too late. If Queen Victoria's example were

followed more generally how many tears would be spared to children who are forced to learn subjects of study for which they are not by nature endowed, and how many vexations of spirit might the teacher himself be spared! Who will presume to forecast the results were Gall's doctrine brought to bear in aid of education?

The following remarks by Mr. Francis Galton, M.A., F.R.S., have some bearing on this subject:

"There appears at length to be a somewhat general concurrence of opinion that the possibilities of a child's future career are more narrowly limited than our forefathers were fondly disposed to believe. *It is highly desirable to give more attention to investigate and define the capacities of each individual.* They form his stock-in-trade, the amount of which admits of definition, whereby he has to gain his livelihood, and to fulfil the claims upon him as head of a family and a citizen. So far as we succeed in measuring and expressing them, so far, almost in an equal degree, should we be able *to forecast what the man is really fit for and what he may undertake with the least risk of disappointment.* They would encourage him if unduly timid, or they would warn him from efforts doomed to be wasted."

In the review of one of the author's publications, the *Saturday Review* says: "All that phrenology asserts is that, with the assistance of certain known elements,—such as physical temperament, education, and surroundings,—positive conclusions as to psychical character can be drawn from the configuration of the skull; and *in the light of the present condition of physiological science this claim can surely be considered neither illogical nor extravagant.*"

But it is as regards *moral education* that Gall's doctrine proves most useful. *The moral imbecile is born, not made*, and bears his character imprinted on his brain and skull. The disciple of Gall has not got to wait till such an individual is "found guilty" ten or fifteen times and punished with progressive terms of imprisonment, when he becomes too old to do anything to enable him to exercise more self-control. He would take the vicious child straight away to a "moral" reformatory, where the higher faculties and altruistic sentiments are exercised, so as to produce such an equilibrium in the brain as will enable the grown-up man to withstand temptation.

A CRIMINAL YOUTH

Son of wealthy parents. The portrait is taken from a "Hue and Cry." Notice the bulging of the temporal region.

Children should never be "adopted" by strangers before consulting an expert in Gall's doctrine.

The author has had to overcome many and serious obstacles to enable him to accomplish the immense task which he had set himself to perform, and in consequence of the disbelief in the doctrine being so universal, he has had to trust entirely to his own powers and resources. It would be a subject for wonder, accordingly, were there no lapses in this work, but let the reader be fair and not discard the whole because of some minor defects. If the work is to be carried

forward, *those who feel interested in it should co-operate.* They might form a "*Society for the systematic study of the mental organisation of Man.*" Their investigations, if properly conducted, should prove of utmost benefit to mankind.

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